The New England
Journal of Medicine

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VOLUME 221 NOVEMBER 30, 1939 NUMBER 22

MASSACHUSETTS MEDICAL SOCIETY

Section of Obstetrics and Gynecology

MATERNAL MORTALITY STUDY IN MASSACHUSETTS FOR 1938*

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BOSTON

IT IS barely possible that some of those present are unfamiliar with the maternal mortality studies which have been carried out by this section in the last two years. Three years ago the Division of Child Hygiene of the Massachusetts Department of Public Health asked the officers of the section to conduct such an investigation. Permission was obtained from the Council, and in 1937 and 1938 the records of all the maternal deaths in Massachusetts were investigated by members of this section. This study is to be continued for three more years.

The primary purpose of the investigation is to learn the facts; the hope is to improve the practice of obstetrics in Massachusetts, where it is, unfortunately, far from perfect. Many criticisms can be made, but if we commence with the premise that medicine is practiced solely for the benefit of patients and that hospitals have no right to exist unless the patients receive the best possible care, any criticism of the practice of obstetrics in this state is justifiable. Hospitals are not established for the convenience of physicians but for the care of patients, and if the latter in certain hospitals is not the best, the hospitals in question are open to condemnation.

The year 1938 showed an improvement over 1937 in the extent of maternal mortality. In 1937 the death rate was 4.1 per 1000 living births; in 1938 it was 3.7. It is at least conceivable that the publicity which has resulted from what the section has done has had a stimulative effect on the medical profession and on the hospitals and so has played a small part in the decrease in rate. Such a slight improvement cannot, however, be accepted as satisfactory. The fact that in Rhode Island last year the mortality rate was 2.6 per 1000 live births shows clearly that it is possible to reduce materially the mortality in Massachusetts.

The mortality rate in Massachusetts for 1938 and that in Boston (3.6) are virtually identical. This indicates that, so far as figures are significant, the practice of obstetrics in rural communities is quite as good as, but no better than, that in the big cities with their large hospitals and medical schools. On the other hand, it must be realized that some city institutions do far better work than is done generally. The Boston Lying-in Hospital, for instance, had a death rate in 1938 of 1.1 per 1000 live births. Obviously, then, the quality of obstetric practice in this hospital is far superior to that in the State at large and in the rest of Boston. It should be our aim to meet this excellent figure.

Obstetric practice in Massachusetts cannot be improved unless we know where the trouble lies. We must consider the separate factors entering into obstetric mortality, namely the patient, the medical profession and the hospital.

As to the patient, our study of the records demonstrates that a certain number of deaths are due solely to the patient's neglecting to consult a physician on the appearance of unusual symptoms. There must be more adequate education of the public, and better standards of prenatal care must be established and maintained. It must never be the case that a woman is unable to obtain intelligent prenatal care for lack of money or for any other reason.

*This section meeting was held and the following three papers read during the annual meeting of the Massachusetts Medical Society, Worcester, Massachusetts, June 8, 1939.

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The next share of responsibility devolves upon the medical profession. The study of these cases showed that some lives were lost because of the attending physician's ignorance or neglect. This situation can be remedied only by better obstetric education and by a more conscientious attitude on the part of physicians toward their patients.

The third responsible factor is the hospital. Not all hospitals are equally equipped or equally well staffed, and many hospitals that are both well equipped and well manned are not adequately supervised. Fortunately, the day when the doctor can do as he pleases with the individual patient is passing. He can no longer withstand the criticism of his fellow practitioners when he knows that he is indulging in practices in obstetrics that he would reject in surgery. The staffs of the hospitals must be better supervised. Hospital authorities must realize that their primary responsibility is to give their patients the best possible obstetric care. Adequate consultation in obstetric complications can easily be made available to any hospital desiring it.

This paper does not attempt to analyze in statistical detail the obstetric work carried on in 1938. Briefly, 282 fatal cases were reviewed, compared with 325 in 1937. Six of these were found to be non-obstetric, so that the actual total is 276 maternal deaths, or a mortality rate of 3.7 per 1000 live births. The rate for 1927 was 6.3, that for 1936 4.9 and that for 1937 4.1. Thus it would appear that the mortality rate is steadily decreasing, but it must be remembered that the number of cases of sepsis in 1938 was quite low, a fact which lessens the significance of the low mortality rate. Furthermore, it should not be forgotten that Rhode Island, as mentioned above, had a mortality rate in 1938 of only 2.6.

Sepsis still caused the greatest number of puerperal deaths in 1938, namely 66. Most of these followed operative deliveries, showing that less unnecessary operating is needed. The more conservative we become the less sepsis there will be. The records reveal that a physician in one institution delivered operatively over 25 per cent of his patients, clear evidence that in some parts of the State there has been too much operative interference.

There were 5 deaths from pernicious vomiting in 1938, compared with 4 in 1937. Any patient who dies of pernicious vomiting does so either because she does not, through ignorance, present herself for treatment soon enough or because she does not receive adequate care after being hospitalized. Therefore, since the great majority of deaths from this cause are due to delay in giving proper treatment, those here cited must be classed as preventable.

There are still too many deaths from anesthesia: there were 9 in 1938.

Ectopic pregnancy will always cause a certain number of deaths. There were 12 last year, in 5 of which the patients were not operated on. In some cases the fault lay with the physician, who did not recognize that irregular bleeding during pregnancy may indicate ectopic pregnancy; in others the patient's ignorance of the same fact was to blame.

There were 13 deaths in 1938 due solely to surgical causes. Too often when a woman is pregnant it is forgotten that she is subject to the same surgical ailments that other women have. The sooner the medical profession realizes that a pregnant woman can also have appendicitis, gall-bladder disease or intestinal obstruction, all of which should be treated surgically, the fewer deaths there will be from surgical complications. Last year there were 5 deaths from appendicitis, 4 from idiopathic peritonitis, 1 from gall-bladder disease and 3 from intestinal obstruction. In all these cases, except those of idiopathic peritonitis, the deaths could have been prevented.

There were 7 deaths attributed to shock. As is generally recognized, many such cases can be cured by immediate and adequate transfusion.

There were 6 deaths listed as accidents of labor, namely rupture of the uterus, 5 spontaneous and 1 traumatic. Undoubtedly some of those listed as dying from shock actually had a ruptured uterus. We must remember that accouchement forcé is of historical interest only; when we learn that a physician used that method in dilating the cervix and delivered the patient by version, only to have her die three hours later, we can only think that the man, although perfectly honest himself, has not kept abreast of the times.

Twenty-three patients died following abortions. We cannot at present do much to help this situation.

There were 2 deaths from emboli in 1938. Unless such deaths are associated with unwarranted operative procedures they cannot be prevented.

There are still too many deaths due to albuminuria and eclampsia. There were 31 such deaths in 1938, in 11 of which the patient was undelivered. We know perfectly well that most of these deaths were preventable. Some of them were the result of the ignorance of the patient — there were two patients who had never seen a doctor until they appeared in the hospital, edematous and very ill. Some of the deaths were undoubtedly due to unintelligent procrastination by the physician;

earlier induction of labor would have prevented them.

Hemorrhage was the cause of 26 deaths, and will continue to contribute largely to maternal mortality. We should be adequately prepared for intelligent transfusion, by which is meant that all patients should be matched and cross-matched. There were 2 deaths apparently due to errors in typing.

Twenty patients died of pneumonia and 17 of cardiac disease. Pneumonia in pregnancy is a very serious complication, and obstetricians who have patients with pneumonia should secure the best possible medical consultant. The patient should be treated intelligently and adequately. Five of the patients who died of cardiac disease were undelivered, and 5 were delivered normally. It is a generally accepted maxim that if a woman dies of heart disease undelivered, she should never have been allowed to become pregnant in the first place.

This study is to continue for three years more. We need the full co-operation of every physician in the State, and we hope that this will be given us gladly and willingly.

330 Dartmouth Street.

RUPTURE OF THE UTERUS

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BOSTON

RUPTURE of the uterus has occurred at the Boston City Hospital 33 times in the last 20 years. This incidence, it must be realized, is high because of the large number of complicated cases in which the patient was referred to the hospital after having been in labor for many hours. The 33 cases may be classified according to cause as shown in Table 1.

In this series 17 women died, a mortality of 53 per cent, and 29 babies, a mortality of 88 per cent. The rupture was treated by a supravaginal hysterectomy in 21 cases with 11 deaths, a mortality of 52 per cent. In 4 cases a laparotomy was performed and the wound was sutured; of these patients 2 died. Eight cases were treated by vaginal pack, with 5 deaths, a mortality of 63 per cent.

TABLE 1. *Classification of Cases According to Cause.*

CAUSE	NO. OF CASES
Forceps failure and version	9
Previous cesarean section	6
Version	4
Spontaneous rupture	3
Prolonged labor (patient undelivered)	2
Manual removal of placenta	2
Low forceps	2
External trauma	1
Breech extraction	1
High forceps	2
Normal delivery	1
Total	33

The mechanism of the dilatation of the cervix was first described by Bandl. He pointed out that in the uterus during the process of labor two distinct processes take place. The fundus contracts forcibly and the cervix dilates. The musculature is therefore divided into two entirely different segments — the upper or contracting and the lower or dilating.

With each contraction of the uterus there is a slight taking up of the lower uterine segment, and this phenomenon lasts as long as the uterus continues to contract. The cervix is held securely in place by the sacral ligaments posteriorly, by the broad ligaments laterally and by the round ligaments laterally and anteriorly. It is thus apparent that after the cervix is fully dilated, unless the contents of the uterus are moved forward in the birth canal, the lower uterine segment becomes excessively thinned out, and if relief is not afforded, rupture may supervene.

The causes of rupture may be classified as traumatic and non-traumatic. In the first group are included ruptures from external trauma as from a fall or blow, internal podalic version, accouchement forcé, the use of forceps through an incompletely dilated cervix and the manual removal of the placenta. The second group includes ruptures from dystocia, scars from previous cesarean section, curettage, myomectomy, placenta previa and the injudicious use of pituitrin.

The rupture, again, may be either complete or incomplete. In the former type the peritoneum covering the uterus is included, and there is communication with the abdominal cavity. The fetus is frequently extruded from the uterus and is found in the peritoneal cavity immediately beneath the examining fingers, while the uterus is found as a contracted organ at one side. If the baby has been delivered from below, the examining hand may find in the vagina a loop of intestine or a portion of omentum. If these structures are not present it is usually possible to introduce the hand into the abdominal cavity.

In incomplete ruptures the tear involves the uterine musculature through to the peritoneum, but the abdominal cavity is not entered. A

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hematoma invariably forms at the site of the rupture, and the bleeding provoked by its disturbance on vaginal examination, added to the shock and the amount of blood already lost, is frequently enough to cause immediate death.

TRAUMATIC RUPTURE

Forceps failure and version constituted the most frequent cause of ruptured uterus in our series. This sequence of events must be considered as having been due to an error in obstetric judgment. The fact that the head after many hours cannot be pulled through the pelvic brim is positive evidence that the patient should have been delivered by cesarean section. In many cases this should have been done after the patient had had a reasonable test of labor.

It is also true that most patients will deliver themselves if treated with intelligent expectancy. All obstetricians have encountered cases, perhaps well advanced in labor, in which a reasonable amount of traction with forceps has failed to advance the head. Version done in these cases is frequently successful. This satisfactory termination may be understood if we consider the head as being roughly triangular. When a forceps is applied to the vertex, one is trying to cause the base of the triangle to advance, whereas with version the apex of the triangle is applied to the pelvic inlet. In these poorly handled cases of disproportion it takes many hours of labor to dilate the cervix. One reason is that the membranes rupture early; another is that the disproportion between the head and the pelvis prevents the necessary application of the former to the cervix as a dilating agent. The prolonged labor results in the excessive thinning out of the lower uterine segment, and unless extreme caution is taken, rupture of the uterus may result even following the version.

The reprehensible dragging of a head with traction forceps through an undilated cervix is an obvious cause of rupture of the uterus. The use of forceps, even in cases in which the cervix is thought to be fully dilated, occasionally results in marked damage. If the lower uterine segment has thinned out to its greatest capacity, it is understandable that what would ordinarily result in a simple cervical tear might cause the splitting of the overstretched lower uterine segment. This condition may also be accounted for by the fact that until the head is on the perineum and in sight, complete retraction of the cervical os has not taken place. With the application of forceps in the high or mid position, particularly if a slight rim of cervix is present, a forceful dilatation may also produce a tear which involves the lower uterine segment. Rarely, a tear which accompanies a normal delivery extends beyond the cervix. This unfortunate accident occurred in one of our cases and resulted in the patient's death.

The unskillful introduction of forceps blades, the forceful rotation of the fetal head and the manipulation of destructive instruments for the removal of a dead fetus may also cause perforation of the uterine wall.

For many years it was agreed that if a patient had had a cesarean section all subsequent pregnancies should be terminated in the same manner. During the last decade this dictum has been somewhat modified. If the cesarean section was done on account of an abnormal pelvis or for a cardiac condition, it is obvious that the same indication exists in all subsequent pregnancies. If, however, a multiparous woman has had a cesarean section for an intercurrent indication, such as placenta previa or the separation of a normally implanted placenta, it is reasonable in a subsequent pregnancy to give her a trial at labor, provided this is done in a well-equipped maternity hospital. Labor may be permitted to continue as long as progress seems normal. If any evidence of trouble presents itself, such as an irregularly contracting uterus, a tender fundus, a rising maternal pulse or cessation of uterine contractions, a cesarean section should immediately be performed.

It is essential to realize in this connection that if the transient indication occurs in the first pregnancy, the patient should always be delivered by cesarean section. The important point is that this patient would have what amounts to a primiparous labor so far as her soft parts are concerned, and such a long and tedious labor should be avoided in the patient having a cesarean scar in the uterus.

In hospital practice, patients who have been delivered by cesarean section occasionally avoid hospitalization during the first stage of labor in an effort to escape a second operation. Frequently these women have some pelvic indication and expose themselves to the grave danger of a ruptured uterus.

The absence of cases of placenta previa from the present series may be explained by the fact that very few patients at the Boston City Hospital with this condition have been delivered other than by cesarean section during the last twenty years. In the few cases of delivery from below in which rupture may possibly have occurred, its presence may have been obscured by a diagnosis of postpartum hemorrhage. This condition was formerly responsible for many cases of rupture of the uterus — particularly so when the procedure adopted was the indefensible accouchement forcé. As a result of the placenta's being inserted in the lower uterine segment, in these cases the latter is

extremely soft and friable. Any attempt at artificial dilatation results only in extensive tearing. This is also true when hydrostatic bags are used. Even after the expulsion of the largest bag cervical dilatation remains incomplete, and when the head is drawn through the cervix, following version, tears occur which frequently involve the lower uterine segment, with the production of a ruptured uterus.

My memory goes back to the days when accouchement forcé was employed to terminate pregnancy in eclamptic patients. Although I never saw in actual use the instruments devised for dilating the cervix, I have seen several manual dilatations of the cervix, followed by version and extraction. In the cases that terminated fatally, although the cause of the death was given as eclampsia and the "shock" of cervical dilatation, the patients died, as all must realize, of unrecognized rupture of the uterus.

SPONTANEOUS RUPTURE

In the rare cases in which spontaneous rupture occurs, the uterine wall has been weakened. The conditions which most commonly contribute to its thinning are myomectomy, recent curettement, cancer and hydatidiform mole.

Manual removal of the placenta may result in a perforation of the uterine wall. Blows or falls may be the cause of a rupture. The trauma usually causes damage to the uterine wall; uterine rupture may not follow for some hours, and there may be surprisingly little in the way of signs or symptoms to give warning of its imminence.

I recall a patient who early in the first stage of labor suddenly began to show signs of difficulty. She was a normal multipara who had been followed in the prenatal clinic. Three days before entry she had slipped on a wet floor and, on falling, struck her abdomen against a pail; this was followed by some abdominal pain, and being at full term and believing herself in labor she walked into the hospital. On entrance her pulse was 80 and the physical findings were those of any patient starting labor. She was observed for twenty-four hours in the labor room, and because the pains quieted down was sent to the ward. On the morning of the third day in the hospital she began to have pains again and was sent back to the labor room. Palpation of the abdomen showed clearly that the baby was free in the abdominal cavity and that a rupture of the uterus had occurred. Laparotomy was immediately performed. The baby was found half extruded from the uterus and tamponing a rent in the lower uterine segment, which involved the left broad ligament. When the baby was extracted the pressure on torn vessels was released, and a fatal hemorrhage occurred before hemostasis could be secured. This case is cited to demonstrate how slight the injury may be which results in a rupture of the uterus.

When posterior pituitary extract was first introduced, its indiscriminate use was followed by many serious accidents. Although no such accidents occurred in this series, the danger accompanying the use of the drug should be repeatedly pointed out. Owing to the continued warnings of teachers of obstetrics during the last two decades, this cause of ruptured uterus has been practically eliminated.

CONCLUSIONS

The treatment of rupture of the uterus is preventive. In a very large majority of the cases here reported this complication could have been anticipated. The avoidance of procedures which we have learned are frequently accompanied by serious trouble would have considerably lessened the occurrence of rupture of the uterus, the gravest of all obstetric accidents.

475 Commonwealth Avenue.

DISCUSSION

DR. CHARLES P. SELDON, Boston: Dr. Lynch has presented an analysis of 33 cases of rupture of the uterus treated at the Boston City Hospital. An equal number of cases were treated at the Boston Lying-in Hospital between January 1, 1916, and January 1, 1938, an incidence of 1 in every 1105 deliveries. Eighteen were traumatic, and 14 spontaneous. The incidence of rupture is increased by the injudicious use of pituitary extract during labor, by manual dilatation of the cervix, by internal podalic version and by previous cesarean section.

An outstanding factor in the etiology of traumatic rupture is multiparity. Obesity, large babies, and perhaps other factors predispose to abnormalities of presentation and position, and uterine inertia and cervical dystocia are commoner than in primiparas.

As Dr. Lynch has shown, the sequence of events in the development of traumatic rupture may be quite characteristic. Because of prolonged labor, fetal distress or demands for relief from either the patient or her relatives, the physician feels obligated to bring about delivery under unfavorable circumstances. He accordingly manually dilates the cervix and applies high forceps. Forceps failing, he attempts internal podalic version. Due to previous rupture of the membranes with escape of amniotic fluid, spasticity from prolongation of the labor, or irritability set up by repeated attempts at delivery, the uterine musculature does not relax sufficiently for the baby to be turned easily. Rupture occurs in the thinned-out lower uterine segment.

Since repeated attempts at delivery make the uterine musculature increasingly spastic, craniotomy or a high-forceps operation should not be attempted if there is reasonable doubt of its success. If the operator believes that he can safely deliver the patient by internal podalic version he should proceed forthwith. Full surgical anesthesia with open ether is the anesthesia of choice. If the uterus cannot be relaxed under anesthesia, version should be abandoned and the patient delivered either by an extraperitoneal cesarean section or by a Porro hysterectomy.

Cesarean section is the most important predisposing cause of spontaneous rupture of the uterus. Twenty-seven and three-tenths per cent of all ruptures of the uterus treated at the Boston Lying-in Hospital followed a previous cesarean operation, illustrating that this is not "just another way to have a baby." It was the predisposing factor in 64 per cent of the spontaneous ruptures. Fundal scars tend to rupture during pregnancy while scars in the lower uterine segment pull apart during labor. When the lower segment begins to develop during labor, a longitudinal scar in the lower segment is subjected to less stress than is a transverse scar.

Maternal mortality is influenced by the time interval between rupture and the institution of treatment. Hysterectomy and adequate drainage of the peritoneal cavity performed within four hours of the occurrence of rupture give the best results. Expectancy has no place in the treatment of this condition. Patients with unrecognized or untreated ruptures die of infection if they do not succumb to hemorrhage and shock. There will be fewer unrecognized cases if the operator inserts his hand and carefully palpates the interior of the generative tract following each difficult delivery. Uterine tamponade is a valuable procedure for control of blood loss while preparations are being made for operation. Transfusion is an indispensable adjunct and may save the patient's life.

OBSTETRIC ANALGESIA AND ANESTHESIA

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THIS paper presents an attempt through a survey of the literature to consolidate opinion and to choose a drug or collection of drugs for obstetric use most suited for the average patient under average circumstances. An effort has been made to reflect the opinion of no particular group, but rather to correlate the findings of representative groups throughout the country.

The relief of labor pains has been of interest to medical men for many years. In 1847 Sir James Young Simpson, of Edinburgh, first used chloroform for this purpose.[1] With the development of ether, it was used considerably in obstetrics. In 1870 Alexander Simpson reported the first employment of opiates during the early stages of labor, their use for this purpose having been discovered by accident. For many years afterward the administration of opiates with the addition of ether or chloroform by inhalation was the procedure of choice for relieving labor pains. The development of these measures resulted in much lay and clerical discussion of the moral issues involved. In spite of adverse criticism progress continued, although slowly. Nitrous oxide was developed as an analgesic and anesthetic during labor in 1880, and early in the twentieth century it was brought to this country and thoroughly popularized. Following the introduction of spinal anesthesia in 1889, it was tried in obstetrics by several daring individuals.

Early in this century the use of morphine and scopolamine ("twilight sleep") was suggested by Steinbuchel, followed by Krönig and Gauss. The clinical employment of this combination was observed in European clinics by various interested persons, following which it was introduced in this country. Its wide and indiscriminate adoption brought extensive condemnation over a period of years, and the experimental work of Wallace in relation to the use of ether-oil rectal anesthesia was welcomed. Davis and Gwathmey put this experimental work to clinical use in the early 1920's, adding morphine and magnesium sulfate. This became the accepted procedure for the next few years.

In 1924, twenty years after the discovery of barbituric acid by Fischer and Dilthey, reports on the use of Sodium Amytal began to appear in the obstetrical literature. Since that time the literature on the barbiturate series has become extensive. In 1934 there was published a paper by Irving, Berman and Nelson[2] presenting a comprehensive clinical analysis of modern methods of obstetric analgesia and amnesia. This paper deserves particular mention in that it gives the most suitable and instructive approach to the subject that has yet appeared.

At the present time there are almost as many methods in general use as there are large obstetric clinics in this country. Gradually, valuable information is being compiled which will in the future materially alter methods now in vogue. What is primarily needed is a clearer understanding of pharmacology, pathology and applied physiology as related to these various drugs.

It seems proper to state that there is a small but active group of medical and lay persons who for medical and non-medical reasons deprecate the administration of any drug or combination of drugs in childbirth. These persons state that labor is a normal, essential experience and that failure or refusal to meet its attendant discomfort may result in serious damage to personality. They believe that no woman wants the birth of her baby to be a blank in her memory. They further contend that the pains of childbirth are very much overestimated, and that psychotherapy during the prenatal period can in a majority of

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cases prevent severe pain. Each obstetrician in his own practice and experience must determine whether these contentions are worthy of more than passing notice.

The conclusion to be drawn from the sum total of experience of a group of clinics is that the wide application of the principle of relief of pain during labor presents a definite step forward. This statement is based not on the opinion of any one group but on a study of mortality and morbidity statistics from clinics that have reported various methods of accomplishing this aim. The most ardent opponents of the principle of relief of pain have stated that babies are sacrificed to that end. All available statistics on the subject indicate that the stillbirth and neonatal mortality rates have either not changed or have been substantially reduced during the years in which these drugs have been used. It is apparent that these methods will continue to be employed with frequent modifications and improvements; it is not unreasonable to expect that with a clearer understanding of their dangers and limitations further reductions in mortality rates may be brought about.

It is impossible to discuss fully the advantages or limitations of any drug or group of drugs except as it relates to the anesthesia which follows. An unwisely chosen or improperly administered anesthetic may in a few moments bring about an unnecessary and entirely unforeseen result. In the past much attention has been paid to analgesia and amnesia and very little to anesthesia. Only when we consider the sum total of drugs or gases used for narcosis or anesthesia can we postulate the end results that we may expect to attain.

Clinical experience over a period of years has brought out several facts of considerable value in relation to the administration of drugs during childbirth. These concern both the infant and the mother, and must be carefully considered in the formulation of a suitable modern method of medication.

Opium derivatives are deservedly finding a narrower range of value. Their untoward effect on the respiratory center of the fetus is receiving wide recognition; with the equally satisfactory results obtained from other drugs, the employment of opium has become largely unnecessary. The chief advocates of morphine at the present time utilize it in small doses in order to fortify the action of the barbiturates.

The increased use of paraldehyde is apparently a distinct advance, particularly when it is administered in combination with other drugs. Reports indicate a degree of safety not commonly found in some of the other drugs frequently used. The marked tendency of this drug to prolong labor should be remembered.[3, 4] Paraldehyde easily and quickly passes the placenta, but the effect on the fetus is not a serious one.[5]

Recently, various drugs, particularly of the barbiturate group, have been administered intravenously, both during the course of labor and for terminal anesthesia at the time of delivery. These drugs are distinctly more toxic than similar drugs given by other routes. Anesthetics intravenously administered are contraindicated when a patient has previously received even moderately large doses of other drugs. The marked depressant effect of these drugs when used for terminal anesthesia makes them unsuitable for elective use at the present time.

Avertin is a dangerous drug. It should never be employed except by an expert anesthetist entirely familiar with its limitations. Its major drawback is its profoundly depressant action on the respiratory center; in this respect it is even more dangerous than chloroform.[6] In doses of over 5 mg. per kilogram of body weight it may produce uterine atony, with resultant postpartum hemorrhage. Inasmuch as the depth of narcosis depends on the rate of absorption rather than on the amount given, individual variations are marked and dangerously deep narcosis may result from a moderate dose. Avertin has no place in obstetrics.

The barbiturate series is the most widely used group of drugs in modern obstetrics. It is probable that this popularity is deserved. Reports are numerous, results in different clinics are comparable, and contraindications and limitations are gradually receiving a proper amount of consideration.

Pentobarbital and Sodium Amytal are the members of this group most widely adopted, the former being by far the most popular. These drugs are most commonly given in combination with drugs of other groups; they pass the placenta with ease and affect the fetus. Individual susceptibility varies widely, and moderately toxic doses are fairly common. When they are given by mouth, respirations are decreased in rate and amplitude as the dose is increased, owing to a direct effect on the respiratory center. Contractions of the parturient uterus are not affected by doses causing complete analgesia.[7]

In employing the barbiturates it is important to give a small initial dose in order to determine idiosyncrasy to this group. Massive single doses are not only unnecessary but decidedly dangerous. The proper dose is the least amount that will give the desired result. This depends directly on the experience of the obstetrician and on the constant observation of the patient in labor. No rules as

to dosage can be given, either in relation to the weight or the age of the patient. Patients who are not good anesthetic risks should not be subjected to prolonged narcosis and depression. Pulmonary complications and the recent ingestion of food are contraindications. It must be remembered that their employment is always a matter of election and not of necessity.

There can be no doubt that babies as well as mothers are affected by the medication. This effect is determined by the size of the dose, the time of administration and the susceptibility of the baby, whether full term or premature. It is probable that the barbiturates should be administered with considerable care in the management of premature labor.[8] In the average case the effect on the baby, although present, is not detrimental to its welfare. All studies indicate that since these and similar drugs came into general use stillbirth and neonatal death rates have remained the same or have been substantially reduced.[8–10]

The occurrence of pulmonary edema is a distressing effect of this group of drugs in an occasional case.[11] Reports of this complication are very rare in the literature, but the general impression is that it occurs often enough to be of great importance. This type of pathologic change is commonly found in animals following large doses, and its occurrence in the human subject following relatively small doses is probably associated with idiosyncrasy. The role of partially obstructed breathing in the causation of pulmonary edema has been reported by a number of observers. In dogs anesthetized with sodium barbital Moore and Binger[12] found no lung changes following obstruction to expiration, but obstruction to inspiration characteristically produced congestion and edema of the lungs. It is probable that this effect is due to the interference with a free airway rather than to any specific effect of the drug. Observations of this nature are of great clinical significance, and may well partially explain the occurrence of these signs and symptoms in patients receiving barbiturates. It is almost a universal finding that patients showing pulmonary edema have also "swallowed their tongues." It is obviously necessary to maintain a free airway in all persons under the effect of the barbiturates. The constant attendance of a responsible, experienced person is imperative.

Such pulmonary complications do not mean that these drugs are too dangerous for general adoption. They do indicate that cases must be individualized and that supervision must be strict. Their occurrence will be lowest in those cases where their possibility is borne in mind and proper measures are instituted for their prevention. It is certain that these drugs, in large doses, have in the past been indiscriminately used by those unfamiliar with their pharmacologic action and toxic manifestations. This does not mean, however, that their employment increases the patient's risk in properly selected cases.

The amnesic action of scopolamine is made use of in most drug combinations. The incidence of successful results from the mother's point of view is very much lowered in those cases in which it is not used.[2] Relatively small doses at infrequent intervals are all that is necessary. Sensitivity to this drug is common, and initial doses should be small in order to determine the patient's reaction. If an untoward reaction occurs, the dose should not be repeated. Several papers have appeared attributing an increased incidence of puerperal psychosis and insanity to the use of scopolamine. The experience of most clinics has not borne out this contention.

The large majority of patients receiving drugs during the course of labor also receive some type of anesthesia at the time of delivery. The choice of an anesthetic for this purpose has not gained the attention it deserves; in addition to the usual indications and contraindications for anesthesia, we must consider its effect on the fetus. This appears doubly significant when we realize that the infant will be born at a time when the depressant factor is at its height, and under the direct effect of any anoxemia that may be present. We are faced with what amounts to a choice of anesthesia for the infant. Deep surgical anesthesia and any degree of anoxemia must be avoided whenever possible. Improperly administered anesthesia in all probability accounts for more slow births than does the character of the drugs given during labor. The value of minimal anesthesia during premature childbirth is well known. It is equally important in every full-term delivery.

The well-known dangers of chloroform do not require discussion. The consensus is that the drug has no place in obstetrics.

Cyclopropane has certain theoretical advantages, but requires special equipment and the services of a highly trained anesthetist. It is being widely used in several obstetric clinics at the present time; final judgment concerning this gas must await future developments.

Ether has a wide range of safety and usefulness. A minimum of equipment is necessary for its administration. Its chief disadvantages are the difficulties attendant on induction and the unpleasant nausea and vomiting which so frequently follow its administration. When given in full anesthetic doses its depressant effect on the fetus is frequently evident. It is most commonly used in combination with nitrous oxide for terminal

anesthesia. Ether in oil is frequently given rectally during the course of labor. Its greatest value when so used lies in combating the restlessness following the administration of other drugs. It is best administered in repeated small doses, always remembering that large doses given rectally late in labor are very likely to affect the fetus.

In this country nitrous oxide enjoys great popularity, not only as an agent for terminal anesthesia but also to enforce the action of various drugs during labor. When properly administered it is probably the most satisfactory agent for obstetric anesthesia now known; when improperly given it is exceedingly dangerous for both mother and child. Its untoward effects are entirely due to asphyxia resulting from faulty administration. Owing to its low potency it is frequently given with minimal amounts of oxygen. In many patients it is impossible to obtain proper anesthesia and still supply sufficient oxygen to prevent cyanosis. In the presence of anemia, severe anoxemia may be present before cyanosis is easily visible. For this reason anesthesia should never be given without a knowledge of the hemoglobin value, nor should this gas ever be administered without oxygen, even for short periods during labor pains.[13] When we consider the manner in which this gas is commonly employed by untrained persons, it is surprising that its results have been as good as those reported.

Several papers have recently appeared in the literature concerning the irreparable damage to the central nervous system resulting from insufficient oxygen concentrations during the course of nitrous oxide anesthesia.[14] If these changes can occur in the fully developed nervous system of the adult, how much more serious damage may we expect to see in the undeveloped central nervous system of the newborn or unborn infant. Eastman[15] has concluded that, when given in concentrations of 90 per cent or stronger over periods exceeding five minutes marked degrees of fetal anoxemia are produced in about one baby out of three, and occasionally profound asphyxia neonatorum results. It is fair to conclude that nitrous oxide and oxygen mixtures should always contain 15 to 20 per cent of oxygen.

It is quite probable that certain cases of fetal asphyxia, formerly considered due to the use of drugs during labor, are the direct result of improperly chosen or poorly administered anesthetics. Furthermore, obstetric anesthesia should be given only by those trained in its use and familiar with the pharmacologic action of the agents employed.

With an understanding of the physiology of labor and the pharmacology of various groups of drugs, let us outline the management of a hypothetical case during labor. We shall presume that our patient is a normal primipara without intercurrent disease, whose delivery is to be effected in a well-equipped hospital under the supervision of one qualified by training and experience to make obstetric decisions. For use during labor we shall choose that group of drugs combining, in the opinion of a majority of practicing obstetricians, the all-important virtues of efficiency and safety, when judiciously employed. These drugs will be Pentobarbital and scopolamine, with the addition of small rectal doses of either paraldehyde or ether if indicated. Terminal anesthesia will consist of a nitrous oxide, oxygen and ether mixture, given with a minimal oxygen content of 15 to 20 per cent.

Our patient will have received small doses of Pentobarbital several times during the prenatal period in an attempt to determine any marked idiosyncrasy. If she has followed our instructions she will not have eaten anything following the initial occurrence of labor pains. The patient will be sent to the hospital as early in labor as possible. In addition to the usual preparations a red-cell count and a hemoglobin determination will be done routinely. If time permits, several enemas will be given. Thorough cleansing of the lower bowel is essential, not only to ensure a clean field at the time of delivery but also to facilitate the absorption of any rectal medication.

The patient will be told that she can have the medication as soon as she feels uncomfortable as a result of contractions. Most patients want nothing until they are having regular contractions of moderate severity. The initial dose of Pentobarbital will be 4½ to 6 gr., depending on the weight of the patient. This will be given in capsules by mouth and will be accompanied by 1/150 gr. of scopolamine, given hypodermically. The patient will at once be placed in a quiet, darkened room with a competent attendant, who will remain with her until she has roused following delivery. In the absence of assistance of this sort, the patient will of necessity be denied medication. The attendant will not, without relief, leave the patient's side for any reason whatever; she will at frequent intervals determine and chart the frequency, duration and severity of uterine contractions as well as the fetal heart rate. The attending physician will check these determinations at times, and will remain in constant touch with the progress of labor. No one should ask or expect nursing attendants, no matter how well trained, to assume responsibility for the management of a patient under medication.

One hour following the initial medication another dose of Pentobarbital may be given, depending on the patient's condition. A maximum of 3 gr. is usually all that is necessary; this will be

given by rectum, the capsules being punctured with a needle to facilitate absorption. Another dose of scopolamine will be given at this time, 1/200 gr. If marked flushing or a distinct rise in pulse rate followed the initial dose, the second dose will be omitted. It will rarely be necessary or advisable to give further doses.

From this time on, Pentobarbital will be given only in 1½-gr. doses and only on indication. The total dose during labor should in all probability not exceed 10½ gr.

The attendant will be instructed or will have learned from experience to restrain the patient as little as possible. Undue restraint only adds to the restlessness and is distinctly to the patient's disadvantage. If marked restlessness occurs, as it well may, it will become advisable to make use of paraldehyde or ether given by rectum. It is better to use small doses repeatedly than one large dose. The recommended dosage for paraldehyde is 8 to 16 cc., and for ether 60 cc. If delivery is imminent at the time the indication for further medication arises, the use of nitrous oxide and oxygen during contractions will probably be preferable. By this means the late depressant effect of the former drugs on the fetus can be completely avoided.

When the patient is ready for delivery, anesthesia will be started while the obstetrician is scrubbing. A nitrous oxide and oxygen mixture will be used, with the addition of what ether is necessary. No attempt will be made to increase the depth of anesthesia by reducing the concentration of oxygen. The amount and depth of anesthesia will vary widely with the type of obstetric procedure contemplated; the patient will be kept as light as possible until the birth of the baby. The choice of an anesthetist is an important one, as a fine degree of co-operation is necessary between him and the obstetrician. An expert surgical anesthetist is not necessarily well equipped for obstetric work until such a time as, through training and experience, he has become familiar with the peculiar problems involved. The choice of anesthesia will at all times be determined by the obstetrician.

In conclusion, we may prophesy that in the future new drugs designed to solve a majority of our obstetric problems will appear on the market. Similar drugs have appeared from time to time in the past, some of them well recommended. The small obstetric hospital or the small obstetric unit in a general hospital will best perform its function not by pioneering in the field of obstetric analgesia and anesthesia, but rather by making use of well-tried and comparatively safe methods.

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Discussion

Dr. George M. Shipton, Pittsfield: I think it is very timely that we should have a paper presented before the section on this subject just now. The lay magazines are so filled with the marvelous stories of painless labor that our patients are beginning to come in expecting to be presented with a capsule on Tuesday and a baby on Thursday and know that it was delivered on Wednesday. In order to compete with this situation some obstetricians are promising their patients 100 per cent analgesia and attempting by various means to fulfill that promise. I think that we should in all fairness tell our patients that we wish to do all that we can to ease their stress of labor, that we can accomplish more if they arrive at the hospital early, but that we cannot promise 100 per cent success. We are having an occasional disaster to mother or baby as a result of too strenuous pushing of some of the analgesics.

A word about paraldehyde. I was glad that Dr. Cornwall reasserted that paraldehyde delays labor. You will remember that the early advocates of this drug insisted that it did not delay labor. There again, we may safely explain to our patients that they are going to receive a preparation which may delay labor as long as 50 per cent, but that an eighteen-hour comfortable labor is preferable to a twelve-hour labor without an analgesic.

In addition to delaying labor, paraldehyde is likely to cause a distended bladder, and we must be on the lookout for this complication.

We have had such good success with Pentobarbital, scopolamine, paraldehyde and nitrous oxide, with the technic outlined by Dr. Cornwall, that we are justified in saying that our methods are improving. Nitrous oxide is, I believe, a very valuable analgesic, particularly at the termination of labor and as regards the newborn baby. This combination can be used successfully either for delivery or as the anesthesia and analgesic in cesarean section. And the minute the baby is born in either procedure the patient may be flooded with oxygen. This oxygen permeates rapidly, and the baby even before taking respiratory motion gains color. The amount of oxygen given is not enough to interrupt the anesthesia of the mother and cause her any difficulty, and I feel confident that it has saved a great many babies in the delay before respiration is started.

I congratulate Dr. Cornwall on his thorough survey of the situation and his very fair evaluation of the various methods in vogue.

RUPTURE OF THE LIVER

CHARLES A. LAMB, M.D.*

BOSTON

INJURY to the liver is the commonest of all injuries to the solid organs of the abdomen. At the Boston City Hospital between 1915 and 1937 there have been 60 such cases. Thorlakson and Hay[1] state that at the Winnipeg Hospital there were 10 cases in twenty years out of 200,000 admissions, and that of 3900 accident cases only 3 were those of rupture of the liver. Edler[2] found that in 365 cases of injury to solid organs the liver was involved in 50 per cent. Rupture of the liver, however, is one of the rarest reported surgical emergencies. The importance of a thorough study of this condition lies in the absolute necessity of early diagnosis and operative intervention, in order to control hemorrhage and circumvent infection.

Rupture of the liver is most commonly due to violent injuries, yet seemingly trivial injuries may cause a laceration, as demonstrated by a case at the Boston City Hospital of a nine-year-old boy who ruptured his liver by falling on the edge of a curb. Sudden blows on the trunk are the most frequent cause of this condition, regardless of the source of the blow. It is almost certain that a fall from any extreme height will produce a lesion of some degree in the liver.

It is absolutely essential to recognize rupture of the liver early in order that proper care may be instituted promptly. Thöle[3] states that the mortality increases from 2 to 5 per cent with each hour's delay in treatment. Our statistics confirm this assertion. Spontaneous hemostasis is rare in the liver because the blood vessels are without valves, are thin-walled and do not retract or contract after sectioning, and because blood mixed with bile coagulates slowly. Although the liver apparently destroys a certain number of pathogenic bacteria delivered to it by the portal system, this condition does not hold true when it is traumatized, and in the presence of blood, the same bacteria may, and usually do, produce severe infections. Martin and Trusler[4] have demonstrated that bacteria found in the livers of normal adult dogs rapidly produce toxic amines in the process of incubation in vitro, and believe that the reaction associated with the absorption of putrefactive amines and other split protein products formed by bacterial action on the liver protein in vivo explains the shock syndrome associated with such infection in the human subject. In addition, Boyce and McFetridge[5] have shown that autolysis of liver tissue in vivo has a clinical aspect with regard to so-called "liver death." Aseptic implantation of whole and ground liver into the peritoneal cavity of dogs produced death in eight to eighteen hours, and each dog presented characteristic autolytic peritonitis. When the ground liver was autoclaved before implantation death was delayed for thirty-six hours. These authors believe that death is due to the absorption of toxic products generated from the liver tissue deprived of its circulation. The role of the gas bacillus in autolytic peritonitis they deem entirely secondary, the autolysis of the liver tissue producing the fatal results. In their studies the anaerobic organism was always present in the cultured peritoneal fluid, regardless of whether or not the liver had been autoclaved. Yet the injecting of the peritoneal fluid either intravenously or intraperitoneally failed to produce the picture of autolytic peritonitis. Boyce and McFetridge maintain that the gas bacillus acts as a catalytic agent and merely hastens the autolysis. Their work is of clinical importance in emphasizing the necessity of early exploration in every case in which injury to the liver is suspected. It also indicates the best method of treating such injuries. These authors declare that abrasions should not be touched, that lacerations should be sutured and not packed, and that, where there is extensive lysis of liver tissue, resection of that part is the best treatment.

The liver is the largest internal organ of the body, and by far the largest glandular organ. In the normal state it is almost entirely protected by bony structure. It is supported from the diaphragm by the ligamentum falciforme hepatis and the ligamentum coronarium hepatis (Fig. 1). The peritoneum does not cover the posterior surface of the right lobe, but Glisson's capsule here comes into direct union with the fascia of the diaphragm. The inferior vena cava is a supporting structure for the liver, because this vessel is firmly fixed to it and to the orifice where it passes behind the diaphragm (Fig. 2). The ligamentum falciforme hepatis is of little aid in supporting the liver, for it is a loose fold of peritoneum through which passes the umbilical vein during fetal life. This structure is later obliterated to form the ligamentum teres. The falciforme ligament also carries accessory portal veins and lymphatic vessels which connect with the internal mammary vessels. These vessels come into prominence in portal obstruction when it is necessary for collateral circulation to develop.

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POSITION AND INCIDENCE OF INJURY

The right lobe is involved much more frequently (in 95 per cent of cases) than is the left, chiefly because of its larger size. Its anterior and posterior surfaces are in direct contact with the abdominal wall and receive the full impact of a blow. Of the 60 cases reviewed, involvement of the left lobe occurred in only 3. However, Branch[6] reports a case in which the left lobe was completely detached from the right and the patient made a good recovery following its removal. The positions of the injuries were those given in Figures 1 and 2.

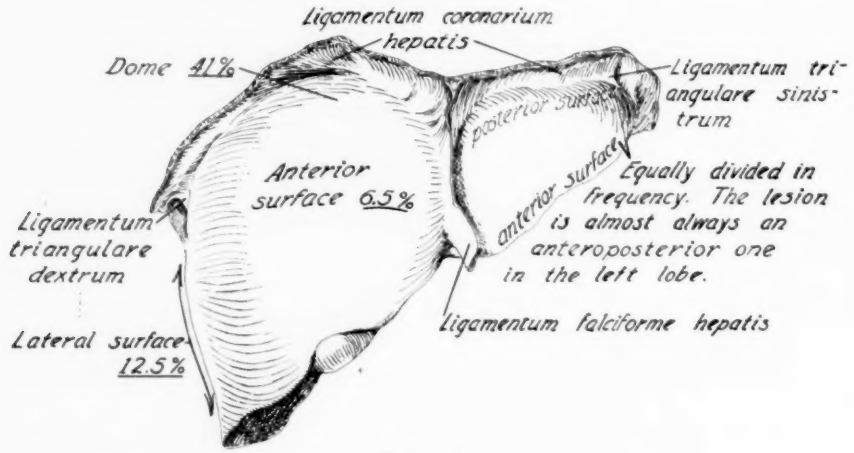
Ligamentum coronarium hepatis
Dome 41%
Ligamentum triangulare sinistrum
Anterior surface 6.5%
Equally divided in frequency. The lesion is almost always an anteroposterior one in the left lobe.
Ligamentum triangulare dextrum
Ligamentum falciforme hepatis
Lateral surface 12.5%

FIGURE 1.

supporting tissue in the young is more elastic than that in the old, but not so abundant, and the parenchymal tissue in the young is therefore less firmly supported. Not a single case in the present series showed cirrhosis. Livers in the young have been torn much more frequently in a stellate direction, and the livers of older patients have shown a tendency to tear in a more or less straight line. There are two other factors influencing the direction of the laceration, both having to do with the force rupturing the liver. When a compression force is applied, the liver tears in an anteroposterior direction. When a flexion force such as would jackknife the body is applied, the direction of the tear is usually transverse. Another significant observation is that liver ruptures in the young are frequently on the inferior surface near the hilus or at the site of attachment of the obliterated umbilical vein (ligamentum teres). The dome of the liver is the part most often ruptured in the older age groups.

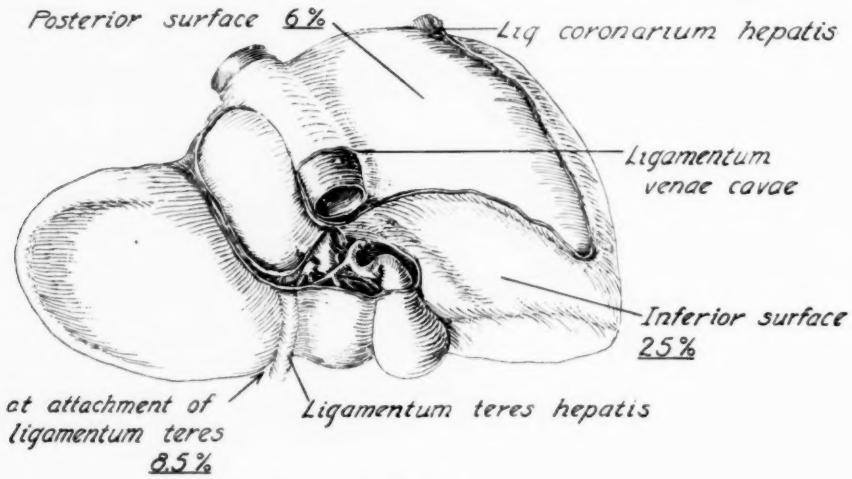

FIGURE 2.

As shown in Chart 1, rupture of the liver is much more frequent in young people than in older ones. This can be accounted for on the basis of violence alone, for the young engage in many more daring activities than do the old. Another reason is that the bony protection in the young is much more supple and that minor blows are therefore more likely to reach the liver. The

CLASSIFICATION OF INJURIES

Moynihan's[7] classification of rupture of the liver is the simplest and most satisfactory. He gives three degrees: rupture of liver tissue with laceration of Glisson's capsule, separation of the capsule with subcapsular hemorrhage and central rupture leading to hematoma and thence to abscess or cyst. Spontaneous rupture should be added to the above classification in order to make it more complete. Spontaneous rupture is almost always secondary to syphilis or carcinoma of the liver. A case due to malaria has been reported (McEwan and McEwan[8]). Mazel[9] explains that in traumatic lesions the rupture is the cause of the hemorrhage, while in spontaneous rupture the hemorrhage is the cause of the rupture.

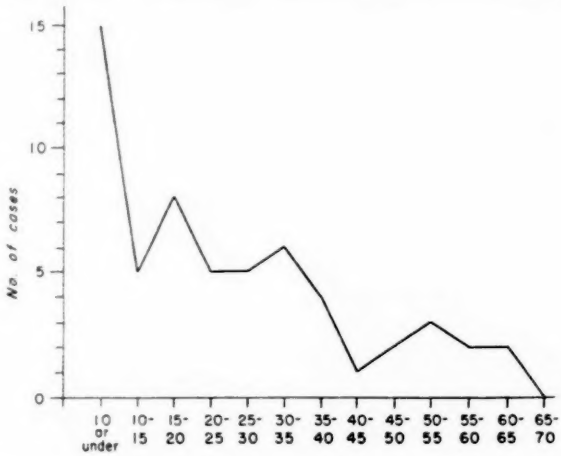

CHART 1. *Incidence of Ruptured Liver According to Age.*

SEX AND ETIOLOGY

The ratio of male to female patients in this series was 5:1. Every one of the women had sustained injury as a result of an automobile accident. Although the men had been injured in all sorts of accidents, most of the injuries had been produced in one way or another by an automobile. One child fell while walking the curbing and struck his right lower ribs. Another coasted into a tree. Another was kicked in the side by a horse. A few were injured while playing games, chiefly football. The wheel of some vehicle traversing the abdomen was a common cause of injury. Falling from a height of two stories was the etiologic factor in 3 cases, and falling from a greater height in many others. There was only 1 case of gunshot wound.

CONDITION OF PATIENTS ON ADMISSION

Seventy-five per cent of the patients were brought to the hospital immediately following the accident. The longest delay in reaching the hospital was sixty hours. Eighty per cent of the patients were in shock on arrival, and it was necessary to combat this condition before operative treatment could be instituted.

PHYSICAL EXAMINATION AND DIAGNOSIS

Physical examination of a typical case of rupture of the liver revealed a patient with a fast pulse, subnormal temperature, cold moist skin, pallor, rapid shallow breathing and pain throughout the abdomen with the greatest tenderness in the right upper quadrant. Laboratory findings were not significant except for the white-blood-cell count, which was high, varying from 13,000 to 28,000. Repeated blood counts which show a progressive fall in the red blood cells and a constant rise in leukocytes are indicative of loss of blood into a serous cavity. The work of Wright and Livingston[10] is interesting in this connection. They have shown that in cases of internal hemorrhage leukocytosis occurs only if bleeding takes place in serous cavities, the rise occurring promptly and reaching a maximum in five or six hours.

An exact diagnosis cannot be made except on exploration, but the need of immediate laparotomy can be shown without great difficulty. Given a patient who has met with a blow to the mid-trunk and soon shows signs of shock, together with tenderness in the right upper quadrant, rebound tenderness (blood in the peritoneal cavity) and an elevated white-cell count (bleeding in a serous cavity), an exploration is mandatory.

TREATMENT OF SHOCK

Usually the patient stands the shock well and responds quickly to treatment. It is wise to take enough time to prepare him for operation. In this respect rupture of the liver differs from rupture of the spleen. A ruptured spleen is likely to exsanguinate the patient more quickly than is a ruptured liver. This is because the splenic artery is a large vessel with high pressure, so that if a main branch is severed, bleeding is profuse. Furthermore, bleeding into the fragile splenic tissue may result in a great increase in pressure and a consequent enlarging of the original rent. Shock should be treated immediately by all the means in one's possession. Because the use of large transfusions is important, it is essential to obtain proper donors at the earliest moment. The patient should receive whole blood before, during and after the operation in sufficient quantities to keep the blood pressure within the range of safety, usually considered to be between 90 and 100 mm. of mercury systolic. The patient should be treated for his shock on the operating floor, and if possible on the operating table, so that movement may be re-

duced to a minimum. Even the slight movement of the abdomen required in transferring the patient from the litter to the operating table may produce further tearing of the liver or dislodge a protecting clot.

COMPLICATIONS

In considering the complications of rupture of the liver the patients in this series are divided into two groups: those who died (41 cases) and those who survived (19 cases). In the latter the complications were fractures in 8 cases (ribs, 3; vertebrae, 2; femur, 3), contusions and abrasions in 16 and ruptures in 6 (gall bladder, 1; tear of mesentery, 3; pneumothorax, 1; hemothorax, 1). Postoperatively 40 per cent of the patients drained bile from their wounds, but in all cases drainage ceased by the twelfth day. Among the patients who died the concomitant injuries were fractures in 14 cases (skull, 9; ribs, 3; vertebrae, 2) and other ruptured viscera in 17 (spleen, 7; bladder, 2; esophagus, 1; kidney, 4; lung, 2; gall bladder, 1). In most cases death occurred early, that is in the first twelve hours after injury. It is thus obvious that patients with serious complicating injuries such as rupture of the spleen, diaphragm or esophagus have much less chance of surviving than those without. The most serious factor contributing to the high mortality was the extent of the lesion. Hemothorax, rupture of the diaphragm, spleen and hollow viscera and rupture of the lung were the factors which determined whether the patient was to die quickly of shock or hemorrhage, or succumb a few days later to pneumonia or other complications.

MORTALITY

Twenty-six patients died before operation could be performed. Of the 34 operated on, 15 died and 19 recovered, a mortality rate of 44 per cent. The mortality rate, however, for the entire series of 60 cases is 68 per cent. Twenty-five patients died in six hours or less after being admitted to the hospital; only 12 died after the first twenty-four hours in the hospital. Deaver and Ashhurst[11] give the mortality rate of their unoperated cases as 80 per cent, and that of their operated ones as 60 per cent.

METHOD OF REPAIR

Good exposure is absolutely necessary in the repair of all ruptured viscera. In thin patients any incision used will give good exposure, but in the barrel-chested it is wiser to limit the incision to a transverse one. The incision may be extended all the way across the abdomen if injury to the spleen or other left-sided organs necessitates it. The ideal to be attained in repair of the liver is the control of hemorrhage and the circumvention of infection. Immediate control of hemorrhage is easily accomplished by digital pressure on the portal vein at the foramen of Winslow. Many surgical methods for the permanent control of hemorrhage have been advocated: such as the use of compression clamps (Clementi[12]); cautery (Ullmann[13]); packing with various materials such as gauze, muscle (Beck[14]), omentum, contiguous organs, fat, fascia and rubber dam; ligature carried on a blunt, non-cutting supple needle such as that used by Kousnetzoff and Pensky[15]; and ligature with various materials including silk, catgut and fascial strips. The use of steam is advocated by Snegirew[16]; that of decalcified bone plates on the upper and under surfaces of the liver is recommended by Ceccherelli and Bianchi.[17] The simplest method that will check hemorrhage is the best. Gentle packing with gauze is the quickest and easiest, but not always the wisest, procedure. There are occasions when large vessels may be tied separately and the liver tissue pulled together by catgut sutures without drainage. In areas inaccessible to the needle, such as the posterior surface, gentle packing is the best method of controlling hemorrhage. Occasionally it is necessary to employ muscle as the hemostatic material. This is easily procured, and can be used with one pedicle still attached. If no nonabsorbable material is used as a tampon the wound may be closed without drainage, even though large areas of liver tissue have been exposed.

To circumvent infection is the next purpose of the operation for injury to the liver. All loose fragments of tissue deprived of blood supply must be removed, for should they remain, autolytic peritonitis is very likely to supervene. A gauze drain left at the site of injury should be removed on the third or fourth day at the latest, unless there is marked infected drainage at this time, in which case the drains should be left for five or six days more. Bile drains in 50 per cent of cases, but this of itself rarely causes harm.

CARE OF COMPLICATIONS

Critical judgment is required in caring for the complications occurring with rupture of the liver. Other injuries to the abdominal organs must be suspected even though a ruptured liver is found. Any blow severe enough to produce one can cause other injuries. Gastric suction by the Wangensteen method is imperative, in our opinion, in all cases of abdominal injury where distention, nausea or vomiting is present or is at least possible, which is nearly always the case. It should be employed before and during operation, and for several days postoperatively until normal peristalsis has oc-

curred. The injuries demanding immediate attention include fractured vertebrae, which must be cared for according to the established methods of support and for the prevention of cord injuries. Ruptured spleens must be removed immediately, and demand the surgeon's first attention. Ruptures of the gastrointestinal tract must be suspected and when found sutured. Ruptured bladders must be sutured and placed on constant catheter drainage, with drainage of the space of Retzius. Ruptured gall bladders may be drained or removed.

CARE OF POSTOPERATIVE COMPLICATIONS

A patient failing to improve after operation should be suspected of harboring an abscess, particularly around the liver and occasionally within it. X-ray examination affords the best check on this condition. Peritonitis is the commonest postoperative condition, and is treated in the usual manner by absolute quiet, intravenous administration of fluids, adoption of Fowler's position, in brief by Ochsnerizing the patient. If the patient survives it is certain that he will have no complaints so far as his liver is concerned, even though considerable liver substance has been removed. Ponfick[18] stated in 1890 that animals could survive with only one eighth of their liver tissue remaining. However, should the blood supply to the liver be destroyed death ensues very quickly.

SUMMARY AND CONCLUSIONS

A series of 60 cases of rupture of the liver is reported.

The gross mortality rate in the series was 68 per cent, and the operative mortality rate 44 per cent.

Suspected ruptured viscera cases should be operated on early, since the mortality rises rapidly with each hour's delay.

It is doubtful whether patients with ruptured livers surviving three days or longer should be operated on.

The presence of an elevated leukocyte count and a falling red-cell count is indicative of bleeding into a serous cavity.

All loose fragments of liver deprived of blood supply should be removed.

The commonest postoperative complications are in the order of frequency: peritonitis, postoperative hemorrhage, subdiaphragmatic abscess, intrahepatic abscess, subhepatic abscess and abscess of the lesser peritoneal cavity.

Except for exposure no type of incision possesses any special advantage. Transverse incision gives a better exposure in barrel-chested patients but is of doubtful advantage in thin patients.

Infection after liver injury is common.

Drainage of bile occurs in 50 per cent of cases but ceases in every case by the third week.

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REPORT ON MEDICAL PROGRESS

TRAUMATIC SURGERY

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IN DISCUSSING the recent advances in the surgery of trauma, it is not so necessary to describe new developments as it is to restate old surgical principles and realign them in the order of their importance. I shall discuss the treatment of burns, the treatment of wounds, the treatment of wringer hands and the injection treatment of hernias.

TREATMENT OF BURNS

The treatment of burns has been discussed in medical literature since the days of Confucius, who used tannic acid in the form of tea, and since the writings of Hippocrates, who used ointment of beeswax and balsam. Even more important than the local care of the burn is the general treatment of the patient. The care of a severely burned patient should consist in treatment of shock and relief of pain, the prevention of blood concentration and local treatment of the burned area.

Shock, with poor pulse, lowered blood pressure and loss of body heat, must be treated by warmth (heaters and blankets) and intravenous fluids; the pain must be allayed by sufficient morphine. Following thermal trauma, there is a great outflowing into the burned area of serum from the tissues and blood stream. This causes a loss of blood plasma and a concentration of cells in the circulating blood, indicated by a sharp increase of the red-blood-cell count. If the plasma loss continues there follow grave physiologic changes ending in respiratory and cardiac failure. In this way a vicious cycle is established and the patient finally dies in collapse. In order to prevent this the patient must be furnished with adequate fluids, either intravenously or by mouth. The red-cell count must be kept at a normal level. Blood transfusions are necessary so as to supply the patient with adequate plasma. All these measures must both precede and accompany the local treatment. It is the pain, shock and loss of plasma that kill the patient rather than the burn itself. Therefore we must direct our attention first to the care of the patient rather than to the local treatment.

The two ancient methods of local treatment are still in common use. The first is the tannic acid method. The burned skin is covered with a freshly made 10 per cent solution of tannic acid in water. This treatment must be continued until the burned skin is thoroughly and completely tanned. In extensive burns it may be necessary to immerse the patient in a tub of warm tannic acid solution, later drying him with a hot-air dryer and returning him to a warm bed in which he is protected by cradles. It may be necessary to re-tan the rim of the eschar.

The second method is the occlusive one. In this the whole burned area is closed with an elastic seal of cod-liver oil ointment or paraffin, held firmly in place with splints. The warm paraffin wax is sprayed on with a special atomizer. These dressings can be done with little pain. The adjacent skin must be kept scrupulously clean in order to prevent external infection. If infection occurs, daily dressings of paraffin wax seem to be the least painful method. After the eschar separates, the clean granulating surface should be promptly covered by razor skin grafts. This method gives a strong and satisfactory skin covering. Reconstructive measures for scars and contractures may be done later. The general condition of the patient as outlined above must be carefully and continuously followed until healing is complete.

TREATMENT OF WOUNDS

Formerly much emphasis was laid on the effectiveness of strong and sometimes colorful antiseptics for sterilizing wounds. It is true that these chemicals destroy bacteria, but at the same time they cause cell changes and even the death of tissues. They hinder rather than help healing. Now simple ancient surgical principles have again come to the fore in the following order: protection, cleansing, repair, dressing and splinting.

Protection

The first-aid treatment should be simple. A sterile protective dressing should be applied and held in place by a bandage under moderate pressure. A splint is often necessary. All efforts to stop bleeding with instruments or to investigate the depth of the wound, or to pour antiseptics of any kind into it, should be discouraged. Clinical

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evidence has shown that the dirt carried into a wound at the time of injury is usually less apt to cause serious infection than unsterilized instruments, dirty fingers or other materials used in hasty and ill-considered efforts at first aid.

Cleansing

In the hospital, sedatives should be given to relieve the pain. The shock should be treated by heat and fluids. Examination should be made for motion, sensation and circulation. This can usually be done without removing the dressing. If a fracture is suspected, x-ray pictures are helpful. In the first six hours after injury, it is reasonably possible to cleanse the wound by mechanical means and to treat it as a clean wound. After this time the wound should be considered infected. As soon as possible the laceration should be cleaned and repaired under perfect aseptic surgical conditions. An anesthetic may be necessary. The open wound itself should be protected with sterile gauze, and the surrounding skin above and below the laceration carefully washed with soap and water.

Following this, the wound should be thoroughly lavaged with copious amounts of salt solution, and at the same time a thin wafer of injured skin edge and all devitalized material should be removed with sharp dissection. The bruised ends of the tendons and nerves may be refreshed. The lavage of salt solution should be continued, with frequent changes of linen and instruments. The true cause of infection in wounds is bacteria, but most of the bacteria introduced into lacerations are not pathogenic or accustomed to living in the human being. Their ability to live and grow does not begin for several hours. By washing and débridement it is possible to render a wound relatively clean. It is amazing to note the ability of normal tissues to withstand bacteria if all devitalized material has been removed.

As noted before, a careful anatomical diagnosis is helpful. It is always discouraging on opening such a wound to find unsuspected lacerations of tendons, nerves and other structures. A constant flow of saline solution from an elevated irrigator should be continued until the débridement is finished. A smaller spray, continued during repair, keeps the tissues warm and moist.

Repair

Repair is best accomplished with simple silk sutures used to approximate tendons, nerves, fascia and skin. Bleeding is best controlled by pressure, only the large vessels being ligated. The tissues should be gently handled. Exposure is obtained with fine retractors or hooks. Grasping with forceps or hemostasis is to be avoided. The saline spray is continued until the skin is closed. If the loss of skin is so severe that the wound cannot be closed, and especially if tendons, fascia or nerves are exposed, primary skin grafting is necessary. A razor or Thiersch graft should be cut and sewed snugly and firmly in place. This closes the entire wound. If this is done, infection, necrosis of tendons, loss of fascia and difficult contractures may be avoided.

Dressing

The dressing should be abundant, soft, cotton sponges. It should be reinforced by a thick three-inch cushion of absorbent cotton extending well above and below, and held firmly in place by a cotton elastic bandage.

Splinting

Splinting gives rest and promotes healing, and a splint made of wood, plaster of Paris or aluminum can be used. With no evidence of infection, such wounds, carefully splinted, may be left for several days. If there are fractures, these must be aligned in proper position at the time of primary closure. The splint holds the bone in the reduced position. If skin grafts have been used, they are best left alone until they have had an opportunity to grow in place.

Treatment of Wringer Hands

There is a new and modern injury to the hand. A housewife, using her washing machine, has her hand drawn between the moving rubber rolls of the electric clothes wringer. Often it is drawn in above the wrist. After the compression is released the hand is removed. It is pale; it is only moderately sore and is sometimes anesthetic. X-ray films reveal no fracture. Immediate treatment is all-important. The hand should be elevated and an absorbent-cotton compression dressing should be applied, extending well above and below the injury. This must be held firmly in place with a cotton elastic bandage, and the hand maintained in the elevated position. If this is done, edema of the subcutaneous tissues can be prevented, and skin necrosis forestalled. The dressing must be removed, the hand inspected and pressure reapplied every four hours, during the next two or three days. If the compression bandage is not applied, the hand will become swollen and edematous. The skin may become anesthetic, and necrosis of large skin areas may follow. Large rubber sponges, if available, are even better than the cotton pressure dressings. If one is alert and aggressive in this treatment, it is possible to prevent swelling and later necrosis of the skin.

Sometimes the initial injury seems so slight that a physician is not consulted until several days later,

when a black necrotic area appears on the back of the hand.

In children these injuries are even more severe, for the arm may be drawn in to the shoulder. The immediate appearance of the hand may not be bad, but the same active preventive measures should be instituted, with constant pressure and frequent inspection for forty-eight to seventy-four hours. Cases have been reported in which necrosis of the skin has been so extensive as to require skin grafting of the entire arm. The crucial and important time for action is during the first hour after the accident.

Injection Treatment of Hernias

During the third century, Heliodorus described the operation for the radical cure of hernia. In 1893, Halsted wrote:

> The operation for the radical cure of hernia in the time of the Roman emperors was quite on a par with the operation as it is usually performed in our day. Four hundred years later the operation had ceased to exist. . . . From that time to the introduction of antiseptic surgery, methods of all sorts, many of them cruel and some barbarous, have been in vogue. They may be classified as follows:
>
> 1. Pressure with or without the simultaneous application of irritating and so-called contracting remedies.
> 2. Caustics and the actual cautery.
> 3. Ligature of the sac, with or without cutting it off.
> 4. Introduction of foreign bodies into the hernial sac.
> 5. Healing in of a detached portion of skin, or of a portion of impacted skin into the abdominal ring.
> 6. The injection of irritating fluids within or outside of the hernial sac.
> 7. The subcutaneous suture.
>
> Some of these methods are interesting as curiosities, and others because they are still practised. . . . We are indebted to antiseptic surgery for reintroducing to us the operation of Heliodorus.

Recently the injection method has been resurrected and advocated in a voluminous literature. The claims made have been enthusiastic, and the inference has been that the results are uniformly satisfactory. Most of these reports, however, do not include end-result studies made several years after the termination of treatment. During the last decade the advocates of this method have narrowed their scope, until now practically all these writers agree that the only cases favorable for treatment are small, indirect inguinal hernias that can be reduced and kept reduced by a truss.

Still more recently the injection method has been subjected to critical review in several large clinics. In a report by Sowles and Shedden of the Massachusetts General Hospital, only half the cases presented for treatment were considered suitable. One hundred and nine cases were injected, with about twelve injections per patient. They state that the ideal patient is active, with good musculature, not obese and with an indirect inguinal hernia of small or moderate size. Under these conditions, the recurrence rate should be held at 25 per cent.

The Hospital for the Ruptured and Crippled in New York City sought to obtain first-hand information concerning the advantages, disadvantages and end results of the injection method of treatment. Fifty-eight patients were treated. Various solutions were used, but no one of them was shown to have any special value. End results in the 58 cases which could be traced showed that there were 47 known failures; of the 11 cases with possible cures, in 9 the patients were still wearing trusses.

In the meantime it has been shown that, considering all types of inguinal hernias in the hands of competent surgeons, the recurrence rate has been steadily decreasing, and at the present time is about 4 per cent.

In view of all this, it would seem that we are now passing through a cycle in the treatment of hernia, that the ideal treatment is still a carefully planned, well-done surgical operation and that injection treatment is distinctly limited in value and is not to be recommended.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Antemortem and Postmortem Records as Used in Weekly Clinicopathological Exercises

founded by richard c. cabot

Tracy B. Mallory, M.D., *Editor*

CASE 25481

Presentation of Case

A sixteen-year-old schoolgirl was admitted from an outside hospital to the Neurological Service because of convulsions of nine months' duration.

The patient was delivered normally at full term. She subsequently developed normally, until five years of age, eleven years before admission, when she began having frequent daily, transitory "spells" lasting a few seconds and characterized by an upward rolling of the eyes and an inability to speak. These attacks continued unremittingly for nine years until the age of fourteen, or two years before entry, when they practically stopped. Catamenia began at that time and occurred regularly every month for one year, with a profuse flow requiring six to eight pads a day for seven days. The menses ceased completely for the year prior to her admission, with the exception of a little spotting on two occasions. At the age of fifteen, about ten months before entry, throbbing occipital headaches, convulsions and a staggering gait appeared. She also developed a voracious appetite and gained 30 pounds in weight. The headaches began rather suddenly, lasted two or three days at a time, and stopped three months later to leave a residual "grinding sensation" in the back of her head and an almost constant ringing in both ears. With the head pain the patient would "arch her head way back" and toward the left. The convulsions occurred at monthly intervals and usually lasted about ten minutes. They began without warning and were characterized by a stiffening of the body, with the mouth and head drawn to the left and clonic movements of the arms, especially the left; she would salivate, bite her tongue and become incontinent of urine. These episodes progressed in severity, with cyanosis during and marked stupor following the attacks. The staggering became an almost drunken gait for the two months before admission. There seemed to be a tendency to fall toward the left.

The patient had reached the first grade of high school. She seemed intellectually normal and did fairly well in her studies. She stopped going to school when her convulsive seizures began. During the two months before entry she became unusually nervous and inattentive. Her mother thought that her hearing and vision were at times impaired. The patient withdrew from her friends, became less active and refused to do housework. She even stated that she was "no good anymore." Four days before admission the patient had four severe convulsions; she was seen by a physician who found "pressure behind the eyes" and advised immediate hospitalization. The patient had had German measles, measles, pertussis, chickenpox and mumps in early childhood, but no other serious illnesses. She developed striae over both hips when she was twelve years old. Similar striae had been noted in one of the patient's four living sisters, most of whom were "stocky." One brother had had "convulsions" from the age of six months to four years, when they stopped. The mother was living and well, although she had diabetes.

Physical examination revealed an inattentive, well-developed obese girl, who was lying in bed exhibiting moderate choreiform movements of the extremities, face and tongue. Her cheeks were flushed, and there were reddish-blue striae over the hips. The heart was slightly enlarged to percussion. The aortic second sound was snapping and was louder than the pulmonic second sound. The blood pressure was 130 systolic, 90 diastolic. The lungs, abdomen and pelvis were normal. The extremities showed moderate but definite choreiform involuntary movements, most marked in the hands and arms. The neurological examination disclosed the following facts. She was inattentive, dull and unco-operative, but was oriented and lucid. Smell and taste were intact, the vision "adequate, but depressed"; the visual fields could not be determined because of a lack of co-operation; she seemed incapable of fixing the eyes steadily on any object "due more to lack of concentration than to anything else," in the opinion of the examiner; no gross defects were noted. There was bilateral edema of two to three diopters of the optic nerve heads. There were no hemorrhages or retinal tumors. The pupils were equal and regular; they reacted promptly to accommodation but failed to respond to light. The external ocular movements showed full lateral excursions, although the movements tended to be jerky. There was a limitation of upward gaze with diplopia on looking upward, and poor convergence. There was no ptosis or nystagmus. No sensory loss over the face was noted, and the corneal reflexes were obtained. There was a right facial asymmetry with weakness, and bilateral tinnitus with audiograms showing "very slight conduction impairment and a tendency toward early nerve involvement." The tongue was in the midline, with normal movements; there was no difficulty in swallowing. The gait was very unsteady. There was a tendency to fall to the left and backward. Rapid

and finer movements of the hands and arms appeared normal. There was a definite asynergia in the finger-to-nose test bilaterally. Hypotonia of the muscles was thought to be present. No definite athetoid movements were noticed, although odd positions of the arms and hands were frequently obtained. Muscular strength in the arms and legs was good; there was no atrophy. No sensory loss was made out in the grosser forms of sensation, although a questionable diminution in position sense was elicited in the arms and legs, especially on the left. Reflexes were equal but slightly depressed. The Babinski, Oppenheim and Chaddock signs were equivocal.

The temperature was 100°F., the pulse 110, and the respirations 20.

The urinary examination was negative, while that of the blood showed a red-cell count of 5,000,000 and a white-cell count of 11,000 with 57 per cent polymorphonuclears. The blood Hinton test was negative. A sugar tolerance test read as follows: fasting, 95; thirty minutes, 191; one hour, 162; two hours, 154; and three hours, 91 mg. per 100 cc. The ventricular tap fluid had a protein of 330 mg. per 100 cc. and was grossly bloody. The fluid was otherwise not examined. X-ray studies of the skull revealed a marked increase in the convolutional markings. The dorsum sella was destroyed. The anterior clinoids were shortened. There was an area about 2 cm. in diameter in the region of the pineal gland which contained multiple small flecks of calcification. Films of the hands were negative. The fingers were long. The distal epiphysis of the ulna was closed; the one in the radius almost closed. The development of the hands showed evidence of precocity. Films of the abdomen and chest were negative.

On the fifteenth hospital day the patient was operated on.

Differential Diagnosis

Dr. Augustus S. Rose: In considering the diagnosis of this rather long case, there are several very striking features, both as to the nature of the lesion and its location. Our attention is attracted at once to the region of the midbrain. We have to deal with a girl of sixteen who had convulsions, headaches, visual disturbances, disturbances in hearing, metabolic disturbances, cessation of the menses and in addition a progressive difficulty in walking. On physical examination we find an obese girl with choked disks, pupils which were fixed to light but reacted well to accommodation, paralysis of upward gaze, which I believe is the key to the diagnosis, and in addition, signs of inco-ordinate asynergia in the finger-to-nose test, some decrease in muscular tone and difficulty in walking. Furthermore, the x-ray films, the choked disks, the history of headaches and the destruction of the dorsum sella are all confirmatory of increased intracranial pressure. The flecks of calcium in the region of the pineal gland cannot be considered normal, and in my opinion in themselves probably warrant the assumption of a tumor. If, then, this reasoning, that we have to deal with a tumor in the region of the pineal gland causing blocking of the aqueduct with an internal hydrocephalus, is correct, how are we to explain the symptoms, and further, where does the tumor originate? We have to consider the following: (1) the pineal gland or immediate vicinity; (2) the hypothalamus or region of the third ventricle; (3) the midline cerebellar region, high in the vermis; and (4) a primary tumor in the midbrain itself.

To consider these in reverse order, from my brief experience I have never seen a case of primary tumor of the midbrain, and in a hurried search last night in various textbooks and one or two journals, I was unable to find a single case of primary tumor in the midbrain that could not be interpreted as pinealoma. They must exist but probably are extremely rare. Furthermore, if the tumor originated in the midbrain we should expect more long-tract signs, for example hemiparesis or more definite evidence of unilateral sensory involvement. Furthermore, we should expect the third or fourth cranial nerve to be more definitely involved. As for the midline cerebellum, discussion is a little more difficult. Cerebellar tumors are prone to occur in children, particularly medulloblastomas, are likely to be located in the midline and notoriously have poor localizing signs, block the aqueduct, cause marked increase in intracranial pressure, with internal hydrocephalus, and cause secondary pressure changes such as are found in the x-ray film of this case. Furthermore, this patient had signs which we must interpret as being true cerebellar signs. She had loss in muscle tone, asynergia, staggering gait, without paralysis, and decreased reflexes. But the assumption of tumor in the midline cerebellum leaves unexplained the x-ray findings of flecks of calcium above the tentorium, and in addition, it is my belief that paralysis of upward gaze and disturbance in the light reflex of the pupil do not occur in subtentorial tumors, nor do they occur secondary to increased intracranial pressure. Furthermore, paralysis of upward gaze which is a supranuclear difficulty has been definitely located in the pretectal region just in front of the superior colliculus. In the same region, just beneath the pineal gland, there are fibers which transmit the light reflex. On the basis of

these two findings interpreted in the light of these physiological facts plus the x-ray I rule out midline cerebellar tumor.

Could it arise from the hypothalamus or the region of the third ventricle? Using the same line of reasoning we should expect symptoms of metabolic disturbances and other difficulties to arise early and be more prominent, and furthermore, you would not expect these same findings that I have just mentioned. We are left, then, with a tumor of the pineal gland or of the region immediately near the pineal gland as the best explanation.

Does a pinealoma explain the whole group of symptoms? I think it does. Dr. Mallory is prone to give us something that may trip us up once in a while, but in looking over the literature and the description of pinealoma, this case might easily be inserted into a textbook as a classical case, with the exception of two groups of symptoms. A pinealoma is a soft tumor which infiltrates only a relatively small area of the midbrain. It usually grows upward and, by virtue of the position underneath the corpus callosum and in between the cerebral hemispheres just above the tentorium cerebelli, it grows forward into the third ventricle. Symptoms of disturbance of hypothalamic function result from direct extension of the tumor or by pressure. Furthermore, this patient had disturbances in hearing or in auditory function, and an ear consultant suggested the possibility of early nerve deafness. This can be explained easily on the interruption and irritation of fibers of the lateral lemnisci or the medial geniculate bodies which are in the same vicinity.

Thus far I have purposely left out discussion of the convulsions. Convulsions of this sort can occur in so-called cerebellar fits. These tend to simulate decerebrate rigidity. They go out of the way to tell us that there was extension or retraction of the head in this case and very marked cyanosis although there were some clonic movements of the extremities. The convulsions can be explained either by generalized increased intracranial pressure or by a functional decerebration at the level of the midbrain. Convulsions due to the latter cause can occur in cases with pinealomas, third ventricle tumors or subtentorial tumors.

There are two other groups of symptoms in this case, however, which I think are somewhat more difficult to explain. First, the spells which were of eleven years' duration and ceased about the time that we are given to understand the present illness began. If there was a pinealoma present I am not prepared to say it was the cause of these spells. It is of great interest, however, to note that these spells which lasted for a few seconds were characterized by upward rotation of the eyes and an inability to speak. Before 1900, Sherrington demonstrated in dogs and monkeys experimentally that stimulation of the region of the superior colliculus produced deviation of the eyes, laterally or upward. Stimulation of the posterior colliculus produced phonation. Let us put that in for what it is worth. No cases of pineal tumor that I have reviewed had symptoms of choreiform movements. Frankly, I cannot explain them. However, the subthalamic nuclei or the corpora luysii, which are small nuclear masses situated slightly anterior to the region concerned, are known to be associated with involuntary movements. If one of them is involved by hemorrhage or thrombosis, marked unilateral choreiform movements occur. Possibly the tumor has encroached upon this region.

My diagnosis, therefore, is pinealoma with internal hydrocephalus. I should like to emphasize that the most important sign in this case, including the x-ray findings, is the paralysis of upward gaze.

Dr. Richard Schatzki: I cannot add very much to the description given in the abstract. The x-ray picture is that of increased intracranial pressure with marked thinning of the skull in the region of the convolutional markings. The sella is enlarged and the dorsum sella is destroyed, which can be due either to a local process or to increase in the intracranial pressure. The relative uninvolvement of the anterior clinoids is in favor of a local process, pressing on the posterior clinoids, although I do not believe that this holds true in all cases. Very often one cannot make a differential diagnosis of destruction due to local disease and that due to generalized intracranial pressure. The most important findings are these three specks of calcification which you may not see from a distance, and which I cannot see in the anteroposterior or posteroanterior view, but which apparently, judging from the report, were seen stereoscopically to lie fairly well in the midline. You would expect this to be the region of the lesion, with possibly pressure on the aqueduct, producing increase in intracranial pressure.

Dr. James B. Ayer: I wish to congratulate Dr. Rose on his excellent analysis of the case. I was particularly interested in his ideas concerning the mechanism of the convulsions. Perhaps his explanation of pressure as a cause of decerebrate rigidity is correct. I also wish to emphasize the importance of the eye finding, in particular of

course the paralysis of upward gaze, as indicating a lesion of the upper midbrain and as a sign very characteristic of pineal tumor. In this connection I might cite a case studied by us within the past year. This man appeared to me to have a frontal lobe abscess. I tried to explain his weakness of upward gaze on the basis of a supranuclear lesion. Dr. Kubik interpreted the case correctly as one of midbrain involvement, and a pineal tumor was found at autopsy. Paralysis of upward gaze appears to be one of the most dependable signs in neurology.

One thing Dr. Rose did not stress was the endocrine picture. This aspect of the case was discussed at a recent neurological staff meeting, and all who were present agreed it was very unusual to find endocrine disturbance caused by pineal tumor, particularly in the female. Reference was made to an article by Horrax and Bailey* which bore out this point. In the twelve cases studied by them were only two girls, who were ten and fifteen years of age. The younger showed no evidence of pubertas praecox. The older had reached maturity at thirteen years. Furthermore these authors cite no examples from the literature of early maturity in girls in whom pineal tumor is present.

Dr. Tracy B. Mallory: In several of Dr. Horrax's boys there was definite precocious puberty. As I remember he observed a sharp difference in the two sexes, frequent endocrinopathy in the male and rare in the female. Even in the boys, however, it was not always present.

Dr. J. H. Means: The endocrine manifestations associated with pineal lesions might well be due to encroachment on the pituitary. Would that be possible?

Dr. Ayer: I suppose it is very likely.

Dr. Mallory: Increased intracranial pressure alone will produce considerable hypertrophy of the adrenal glands, and many of the other endocrine glands, I suspect, would be secondarily implicated.

Dr. Henry R. Viets: One significant point is in regard to the Argyll-Robertson pupils. In this case they are not due to neurosyphilis, but to a lesion of the quadrigeminal plate. The pupils are typical of the Argyll-Robertson type in that they do not respond to light but do to accommodation. One misses, however, the myosis and the irregularity of the pupil so suggestive of neurosyphilis.

Clinical Diagnosis

Pinealoma.

*Horrax, G., and Bailey, P.: Tumors of the pineal body. Arch. Neurol. & Psychiat. 13:423-470, 1925.

Dr. Rose's Diagnoses

Pinealoma.
Internal hydrocephalus.

Anatomical Diagnoses

Primary tumor of pineal, ? medulloblastoma.

Pathological Discussion

Dr. Mallory: This patient was operated on by Dr. Hodgson who after laying back a frontal bone flap exposed the third ventricle which proved to be markedly hydrocephalic. A ventriculotomy was performed without attempting to reach the tumor. Convalescence was uneventful and on the seventh day x-ray therapy was begun and seemed to be well tolerated until the sixteenth postoperative day, when she suddenly became cyanotic and died within a few minutes.

The autopsy was unfortunately limited to examination through the craniotomy wound so we can supply no data as to the condition of the various endocrine glands. No explanation was found within the head for the sudden demise, but Dr. Kubik can tell us more about the tumor.

Dr. Charles S. Kubik: Although autopsy was restricted to examination through the craniotomy wound a satisfactory view could be obtained. There was a discrete, ovoid tumor, measuring 4.5 by 3.5 by 2.5 cm. in the midline in the pineal region, just where Dr. Rose thought it would be. Although it did not seem to involve any of the adjacent tissues one cannot be altogether certain without a microscopic examination that there was no invasion of the tegmen of the midbrain. Despite its apparent origin in the pineal gland, histologically the tumor does not resemble pinealoma or pineoblastoma. An outstanding feature was the presence of columnar cells arranged radially around blood vessels and suggestive of ependymoma. Of course Cushing used to say that so long as there was a good deal of uncertainty as to the classification of tumors in this locality it was best to call them pinealomas anyway, that is, to be guided by position rather than histologic appearance.

Nothing that might have accounted for the seizures was found in the cerebral hemispheres.

Dr. Rose: Would you make an estimation of how long the patient had had the tumor?

Dr. Kubik: I could not, but it was probably a long time. I have not found calcium in any of the sections.

Dr. Schatzki: Did you take x-ray films of the specimen?

Dr. Kubik: No.

CASE 25482

Presentation of Case

A sixty-five-year-old English born carpenter was admitted complaining of a "gastric ulcer."

About twenty years before admission, without prodromal symptoms or pain the patient had suddenly vomited a large amount of "black blood," fainted and later passed black stools. He was treated by an outside physician with rest, a Sippy diet, "liver" and iron. Nearly every year following this episode the patient had, at some time, noticed tarry stools and weakness, but he had had no vomiting; he was treated in the same way but became careless of the regimen between the spells when he felt well. One year before entry he had twice noted the passage of tarry stools for periods of two weeks each. For six months before admission the patient felt a lump in his throat on swallowing; he began vomiting small amounts of recently ingested food, though this occurred only about once a week. He developed heartburn after eating, which was only partly relieved by milk and soda and which sometimes persisted all night. He had lost 15 pounds in weight, but stated that he had been eating less.

The patient was first examined in the Diagnostic Clinic. The physical examination there showed slight tenderness near the umbilicus but no palpable masses. A gastrointestinal series performed five days before admission showed no evidence of disease in the esophagus. The gastric mucosa was smooth and pliable throughout, showing no filling defects. In the cardiac portion of the stomach there was an area suggesting a filling defect which projected into the lumen; this was not constant. There was definite tenderness over the duodenal cap, which showed a clover-leaf deformity with a 4-mm. ulcer crater; the rugae converged toward the crater. Two days after the x-ray studies, or three days before admission, the patient again began having tarry stools. These continued until admission. He also began raising small amounts of blood by retching, less than a half teacupful in all. He complained of great weakness and of a very uncomfortable substernal "nauseated feeling." Because of these symptoms he was referred to the hospital for further studies and treatment.

The physical examination revealed a very pale, slender man lying in bed in no acute distress. The teeth were carious, the peripheral arteries somewhat sclerotic. The pulse was slow and of good volume, and the blood pressure was 110 systolic, 60 diastolic. The heart and lungs were normal. Superficial palpation of the abdomen was negative except for the presence of slight tenderness immediately to the left of the umbilicus. At a more thorough examination later, "firm masses, probably scybala," were felt in the left upper quadrant. By rectum two hard nodules were palpated in the rectovesical pouch.

The temperature was 98°F., the pulse 82, and the respirations 18.

Examination of the blood showed a red-cell count of 2,000,000 with 32 per cent hemoglobin (Sahli), and a white-cell count of 8200 with 88 per cent polymorphonuclears. The urine was negative, and the stools were brown and formed, with a + guaiac test; the vomitus gave a ++++ guaiac test. The serum protein was 5.6 gm. per 100 cc., and the carbon-dioxide combining power, nonprotein nitrogen and chlorides normal. Roentgenograms of the abdomen taken about twelve days after the gastrointestinal series in the Out Patient Department showed that practically all the barium given then lay in the colon. Above this there were several loops of small bowel filled with gas. No definite free air was visualized in the peritoneal cavity, although the diaphragms on the anteroposterior view were not visualized on the film. The patient was given eight 500-cc. blood transfusions in nine days, and his blood count rose to 3,200,000 with a hemoglobin of 60 per cent. On the second and third hospital days the temperature rose to 101.2°F., on the third day to 104, and subsequently fell to 99 for the ensuing days until he was operated on on the ninth day after admission.

Differential Diagnosis

Dr. Allen G. Brailey: "He was treated by an outside physician with rest, a Sippy diet, 'liver' and iron." Twenty years ago the specific benefits of liver in anemia were not known, so I do not know why liver was given.

"Two days after the x-ray studies, or three days before admission, the patient again began having tarry stools." This was possibly the result of having been examined but perhaps only a coincidence.

I should like to look at the x-rays.

Dr. Aubrey O. Hampton: There is certainly a duodenal ulcer, and it appears in some of the films that there is an active ulcer crater. The thing that worries me more than the ulcer is the questionable defect in the cardiac region of the stomach. I wish I could make a fluoroscopic examination.

Dr. Brailey: What about the dilated loops of small intestine which are mentioned?

Dr. Hampton: These films of the abdomen are of such poor quality that the only certain thing

is that there is barium in the colon from the examination done twelve days before. The colon is not very large, but in this area it looks as though there is spasm in the descending portion. I should suspect obstruction of the sigmoid in addition to the lesions in the duodenum and in the fundus of the stomach.

Dr. Brailey: There does not seem to be any question about his having had a duodenal ulcer. The history does not have much to say about the pain after meals which is characteristic of ulcer, but we know peptic ulcers may develop and may repeatedly bleed without much pain. He had repeated hemorrhages, as a result of which he vomited blood, so one would suspect at least one source of bleeding not far below the pylorus. Then, of course, there is the confirming x-ray information in regard to duodenal ulcer. The question is raised as to whether this ulcer perforated. I do not see that we can be certain of that. It is the type of ulcer that very likely penetrated deeply and may have perforated. There was certainly no evidence of perforation on physical examination or from the symptomatology other than the fact that he developed fever on the second and third days. The fever occurred in the course of eight transfusions, and he may have had a febrile reaction to one of these. If his fever was due to perforation it must certainly have resulted in a very localized peritonitis, because nothing is said about the pain or rigidity of the abdominal wall that is characteristic of generalized peritonitis.

How much of a case can one build up in favor of cancer? There was a loss of 15 pounds in weight. The history does not state over what period of time. The intestinal tract was filled with old blood for long periods; he had been nauseated and of course he had anorexia so I cannot see that this weight loss suggests cancer. He ought to have lost weight in any case. Then we have the x-rays done in the Diagnostic Clinic. It would be comforting to know more about this defect in the cardiac portion of the stomach, which apparently is something, but nobody seems to know quite what. We shall have to leave it there for the moment.

What seems the most important point in the entire case is that on rectal examination two hard nodules were palpated. If the examiner felt two hard nodules it must have been a very definite impression, and his observation can be trusted. Nodules in that location are almost invariably due to cancer, I believe. I have tried to think of other things which might readily be felt in that location, such as filled diverticulums of the sigmoid or possibly mesenteric nodes, but I am sure that even if they were described as hard nodules they would be fairly freely movable unless adherent as a result of inflammation. If these nodules were metastases, where was the primary cancer? Cancer of the duodenum is so excessively rare that a diagnosis should seldom be made. These nodules may have been due to lymphoma; or they may have been metastases from a carcinoma of the sigmoid, or even of the small intestine, of which we have little other evidence. But the x-ray examination gave what I believe was a helpful hint when it suggested a filling defect at the cardiac end of the stomach. I think that this man had duodenal ulcer which was the source of bleeding, but that he also had carcinoma of the stomach with peritoneal metastases.

Dr. Tracy B. Mallory: I should like to ask Dr. Brailey if he makes anything of the substernal discomfort.

Dr. Brailey: Presumably it is important, since I have been asked. The heartburn which he complained of simply means esophageal spasm which characteristically occurs in any case of duodenal ulcer, and I passed that by simply as discomfort which was not unlike heartburn. I was willing to exclude disease of the esophagus as such because of the x-ray report.

Dr. Mallory: You did attribute it to presumable spasm of the cardia?

Dr. Brailey: Yes.

Dr. Mallory: Are there any other suggestions?

Dr. Hampton: I think that the mucosa is abnormal both in the lower end of the esophagus and in the fundus of the stomach.

Clinical Diagnoses

Hemorrhage from peptic ulcer.
Pulmonary edema.
Bronchopneumonia?

Dr. Brailey's Diagnoses

Bleeding duodenal ulcer.
Carcinoma of stomach with peritoneal metastases.

Anatomical Diagnoses

Carcinoma of the stomach, with extension to the esophagus and with metastases to the liver, left kidney and mesenteric lymph nodes.
Operative wound: jejunostomy.
Recent leakage around the jejunostomy tube.
Intestinal obstruction, subacute, small and large bowel.
Duodenal ulcer, healed.
Pulmonary edema.
Vascular nephritis.

Pathological Discussion

Dr. Mallory: Dr. Brailey has seized on the essential feature of this case, namely, that the readily demonstrable duodenal ulcer was an inadequate explanation of the clinical picture and that some other lesion must have been present in the gastrointestinal tract. The ordinary gastrointestinal series is by no means infallible. The cardiac antrum is always difficult to visualize and lesions of the small bowel frequently escape attention unless the radiologist's suspicion is aroused and the patient is repeatedly examined at rather short intervals. It is too bad that this patient was not gastroscoped, as almost certainly the lesion would have been picked up by that method. There was a large infiltrating carcinoma of the cardiac portion of the stomach which extended up into the esophagus. It involved nearly 6 cm. of the lesser curvature and a larger portion of the greater curvature. Well up in the cardia was a large crater 3 cm. in diameter with a ragged necrotic base. This I am sure was the source of the hemorrhages. We had a little difficulty in finding the duodenal ulcer. It was there but was inactive so far as we could make out.

Dr. Hampton: It should not have been active if he had carcinoma of the stomach. What did he have wrong with the colon?

Dr. Mallory: There were some dense fibrous adhesions about the hepatic flexure which caused an acute angulation and the cecum was considerably distended. There were relatively few metastases. Even the liver showed only one, but there were definite microscopic metastases found in the bone marrow.

Dr. Brailey: Why did the surgical service operate on him?

Dr. Fiorindo A. Simeone: This man was steadily going downhill and was vomiting a great deal. The operation performed was a jejunostomy in the hope that he might improve sufficiently to permit further study and later perhaps exploratory operation. He lived only seven days after his jejunostomy.

Dr. Mallory: This is the sort of case which occasionally is cited as evidence that a chronic benign ulcer turns into a carcinoma, but in this case we have the evidence that the ulcer was duodenal whereas the cancer was in the upper end of the stomach, and there is no possible connection.

The New England
Journal of Medicine
Formerly the
Boston Medical and Surgical Journal
Established in 1828

Owned by the Massachusetts Medical Society and Published under the Jurisdiction of the Committee on Publications

Official Organ of
The Massachusetts Medical Society
The New Hampshire Medical Society
The Vermont State Medical Society

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Subscription Terms: $6.00 per year in advance, postage paid, for the United States; Canada, $7.04 per year; $8.52 per year for all foreign countries belonging to the Postal Union.

Material for early publication should be received not later than noon on Saturday.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to the *New England Journal of Medicine*, 8 Fenway, Boston, Massachusetts.

WILL PROPRIETARY MEDICAL SCHOOLS BE APPROVED?

The circular letter from the Approving Authority for colleges, universities and medical schools, which appears on another page of this issue of the *Journal* and which has been sent to all medical schools and state boards of registration in medicine, as well as given to the press, brings again to the attention of the public the fact that the attitude of Massachusetts toward medical education has changed recently in an important respect. Accompanying the letter are copies of the statute creating the Authority and of the "Requirements for Approval of Colleges, Universities and Medical Schools," first published, in accordance with the statute, in the autumn of 1936. It is timely to discuss some of the provisions of the law and of the rulings by the Authority.

The Authority seems to have no initiative in the matter of approval, and the basic assumption is that all schools are disqualified until approved. Stated another way, no graduate of any medical school, unless he is exempted by the statute, may be admitted to examination by the Board of Registration in Medicine until the school has asked for and has received approval.

The rulings of the Authority on qualifications required for approval of a college or university show that the education required is to be approximately at the level of a low general average. No individual excellence is required, and the qualifications represent a minimum considerably below what is offered by most students seeking admission to medical schools today. An institution whose students merely meet this minimum will be generally considered to be, and probably will be, a low-grade school. Although colleges and universities must be approved as of this fall for students admitted to medical schools in the fall of 1941, no public statement in regard to this point has been made by the Authority.

The requirements for approval of a medical school are more specific and more interesting, and frequently contain the word "adequate." The preclinical courses, the laboratories, the equipment, the clinical material and the professors must be "adequate." Knowledge of what this means in medical education is widespread. By contrast, there was a medical school which described in its catalogue the obstetric material for teaching as "ample." However, the official returns for the county in which the school was situated and for the four adjacent counties indicated that over a period of five years the number of births had been such as to give an average of less than one birth per student per year, and a considerable number of these were not available for teaching purposes. The checking of the statements in some medical school catalogues against the facts is a time-consuming procedure, but often very illuminating.

In spite of the elasticity of the word "adequate," very properly used in educational matters but abhorrent to those persons who stress the value of

forms and other externals, the net gain seems to be that the requirements may result in a very pedestrian minimum instead of a reasonably high general average. Massachusetts may continue to have some of the poorest medical schools in the United States but these may not be quite so low in grade as they are at present. This is one of the possible weaknesses of attempting improvement by legislation: statutory standards properly attain only a minimum level.

Evaluation of medical schools is not a procedure which the Approving Authority has had to create. Rather searching questionnaires were employed in the recently completed survey of medical schools in the United States and Canada; these had to be filled out and returned and were studied before the inspectors visited the schools. Perhaps the Authority may be able to take advantage of the experience that was gained in this study.

There has been some loose talk about the compulsory closure of medical schools in connection both with the activities of the American Medical Association and with those of the Approving Authority. Neither body has the power to close any medical school. But the strength of the Approving Authority lies apparently in the very procedure which seems at first glance to have been designed merely to protect the school, namely the court review. If a school appeals from the decision of the Authority, the court procedure is the authorization needed by the Authority to make public the basis for its decision. It is this finding of fact, made public, which the proprietary schools have most feared and have always been able to avoid.

The test of the "adequacy" of a medical school, as of any educational institution, is, in the language of the market place, Does it deliver the goods? This pragmatic test may be very difficult to apply in fact. Who is authorized to make a study of the practice of each physician to see if he is really fulfilling his obligations? Would such study be justified? But a comparative test can and has been made. If only 5 per cent of the graduates of one medical school pass the state-board examinations each year, and only 5 per cent of those of another school fail, would the public need any further evidence that the first school should be prevented from giving its poor substitute for medical education, no matter how low its tuition fee? And what if its tuition fee be the same or even higher than that of the second school? In the wool trade there are standards for shoddy, why not in education? If the public can be informed of the facts, they will demand the change. The Approving Authority can apparently perform its function best by a careful accumulation of facts for use in court. It is because proprietary medical schools have been able to suppress the facts that they have had their day.

NOBEL PRIZE WINNERS FOR 1938–39

THE Nobel prize winners for 1938–39 have been announced. For 1938, the prize goes to Professor Corneille Heymans, of Ghent, Belgium, professor of general therapeutics at the University of Ghent. Professor Heymans's work has been on circulation and respiration. He was an early contributor to our knowledge of the carotid sinus and has written extensively on vascular tone, vasomotor reflexes and experimental arterial hypertension.

The prize for 1939 has been given to Dr. Gerhart Domagk, of Wupperthal, Germany, for his work on the therapeutic effects of the derivatives of azo dyes. These substances had been used in the textile industry for many years. In 1913, Eisenberg studied their effects on bacteria and introduced chrysoidin as a chemotherapeutic agent. Although this drug gave excellent bactericidal results in vitro, the effects were not so good in experimental animals. In 1932, another azo compound was synthesized, a derivative of chrysoidin. It was this preparation that Domagk worked with and found strongly protective when given intravenously to mice infected with streptococci. A salt of the same drug was then introduced under the trade name of Prontosil. It was soon pointed out, however, that a slightly different substance, *p*-aminobenzene-sulfonamide, was the active agent, and

this has been used widely ever since that date under the name of sulfanilamide.

The important writings by Heymans and Domagk are on exhibit at the Boston Medical Library. In connection with the Heymans exhibit, it will be remembered that he gave the Dunham Lectures at the Harvard Medical School in November, 1937, and that his lectures were published in the *Journal* in August, 1938.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY*

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TOXIC SEPARATION OF THE PLACENTA, WITH FATAL GAS-BACILLUS INFECTION

Mrs. E. D., a thirty-eight-year-old para V, when thirty-six weeks pregnant, was readmitted to the hospital August 27, 1939, with a story of having had blurring and blackness of vision two hours before entry and having felt that she was going to faint but not actually losing consciousness. For two days there had been no fetal motion. A local doctor was called because of the above symptoms plus the fact that she had had mild abdominal pain and had passed one teaspoonful of bright-red blood per vaginam. He performed a vaginal examination, then sent her to the hospital.

The family history was not recorded. The patient had been well in the past except for recurring attacks of arthritis. At the age of five she had had scarlet fever. In 1928 a dilatation and curettage was performed for an incomplete early abortion. Three other pregnancies had terminated at term without complications. The menstrual periods had been normal and regular except for interruptions during pregnancies. The last menstrual period had begun December 26, 1938, making the expected date of confinement October 1.

The prenatal course was complicated by albuminuria and hypertension. She had been in the hospital from August 15 to 21 for study. At this time she was asymptomatic. Her blood pressure was 166 systolic, 92 diastolic, on entry but was 140 systolic at discharge. She was referred to the toxemia clinic.

On admission to the hospital on August 27 there was no edema except for slight puffiness about the face. The skin was cool to touch. She was perspiring and apprehensive. The pupils reacted to light and accommodation. The chest showed normal expansion, and the lungs were clear. The heart was not enlarged, and there were no murmurs. The pulse was 84, and the blood pressure 120 systolic, 90 diastolic. The abdomen was obese. There was generalized tenderness over the uterus. The fundus was three fingerbreadths below the xiphoid process. The baby was presenting by the vertex in an ROA position, and the fetal heart was not heard. The uterus was contracting about every three minutes and did not completely relax between contractions. No urine was obtained by catheterization. A diagnosis of toxic separation of the placenta was made. She was immediately given 1000 cc. of 5 per cent glucose solution intravenously. Donors were obtained for transfusion.

Two hours following entry the patient was examined under nitrous oxide and oxygen anesthesia. The cervix was high up under the symphysis and was 2.5 cm. in length. The external os admitted a fingertip, and the internal os was completely closed. The presenting part was high and movable. Attempts were gently made to insert the index finger through the internal os in order to reach the membranes, but this could not be accomplished. Mechanical dilatation was not performed. A cervical pack, previously dipped in 3.5 per cent iodine solution, was inserted into the external os. The vagina was then tightly packed with sterile gauze. There was very little bleeding during this procedure. The patient was then allowed to come out of anesthesia and a Spanish windlass binder was applied to the abdomen. Following this she had contractions at two-minute intervals lasting approximately forty-five seconds. The pulse was 120; the blood pressure was 158 systolic, 110 diastolic. The patient complained of constant pain in the back, as well as pain with contractions.

At 8 p.m., six hours after entry, the patient passed 50 cc. of dark-colored urine through an indwelling catheter, and this became solid when boiled on examination for albumin. Her blood pressure had risen to 170 systolic, so she was given 20 cc. of a 10 per cent magnesium sulfate solution intravenously. She was receiving Infundin in 1-minim doses because the uterine contractions were weaker. Because of extreme restlessness the patient was given ¼ gr. of morphine subcutaneously and 20 gr. of chloral hydrate by rectum.

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

Because of lack of progress and inability to rupture the membranes on the first examination, she was re-examined under aseptic precautions at 11 p.m. on the evening of admission, at which time the cervix admitted one finger. The membranes were ruptured. About 150 cc. of light-greenish fluid was obtained. There was no bleeding. The abdominal binder was re-applied, and Infundin stimulation was continued with 1-minim doses. The temperature twelve hours after admission was 97.6°F.

At 8 a.m. on August 28, eighteen hours after entry, her general condition was somewhat improved so far as color and responsiveness were concerned. Contractions were of very mild nature in spite of Infundin in 3-minim doses at hourly intervals. The temperature was 99.4°F., the pulse 100, and the blood pressure 174 systolic, 124 diastolic. Three hours later the systolic pressure was 210, so she was given a second dose of intravenous magnesium sulfate, 20 cc. of a 10 per cent solution. Urine in the drainage bottle at that time measured 150 cc.

At 1:30 p.m., twenty-one hours after admission, a third vaginal examination was performed under ether anesthesia, with the hope of performing a Braxton-Hicks version. The cervix was dilated only to admit one and a half fingers. It was impossible to bring down a foot. The lower segment and cervix were again packed with gauze. She was again started on Infundin stimulation, beginning with 2 minims and working up to 3 minims every forty minutes for four hours. She was given 200 cc. of a 25 per cent glucose solution intravenously at 3 p.m. At 4 p.m. her temperature was 100°F., the pulse 120, the respirations 38, and the blood pressure 168 systolic.

At 8:30 p.m. her pulse suddenly rose to 160 and the blood pressure dropped to 75 systolic. She presented a picture of sudden and extreme collapse. A glucose infusion was immediately started and was followed by 600 cc. of citrated blood. In spite of transfusion she expired at 9:32 p.m., about an hour after her sudden vascular collapse. A moderate amount of crepitation was felt over the suprapubic fatty tissue shortly before the patient expired.

A postmortem examination revealed premature separation of a normally implanted placenta. The cause of death, however, was an overwhelming generalized infection due to *Clostridium welchii*.

Comment. Gas-bacillus infection during pregnancy is fortunately very uncommon. It is quite likely that at the time of one of the vaginal examinations the organism was introduced.

This case presented a very serious toxemia associated with separated placenta when she entered the hospital at the second admission. The cervix undoubtedly was unfavorable to any form of induction. It is barely possible that if the cervix had been instrumentally dilated sufficiently when the first examination was made to allow the rupture of the membranes with or without the insertion of a bag that labor would have resulted much more favorably. The use of divided doses of pituitary extract for the purpose of stimulating labor, even in association with irritating stimuli such as those caused by cervical packing, fortunately does no harm, but it frequently does no good. In retrospect it is possible that cesarean section even in the face of a dead baby represents a mode of treatment which in this case at least might have been more successful than the more conservative method of cervical induction. The diagnosis of gas-bacillus infection was not suspected until the patient was seen on the autopsy table. At that time the skin of the face, arms, abdomen and legs was very much distended; crepitation was felt everywhere.

It is with a certain amount of reticence that this case is published in toto because of the possible influence it may have on the indiscriminate use of pituitary extract. For the purpose of inducing labor, small amounts of the drug can be given without having any effect, a fact which means the causing of no harm, but its safe, indiscriminate use during labor cannot be deduced from this fact. During labor it must be used with the greatest amount of discretion. It is by far safer never to use it until full dilatation is present, being sure that there is no cephalopelvic disproportion.

REPORT OF THE COMMITTEE ON INDUSTRIAL HEALTH

The Physical Examination in Industry

The physical examination in industry is the foundation on which a good industrial medical service is built. Its object is to evaluate the physical status of employees and to observe that status by subsequent periodical re-examinations. Examinations thus are divided into pre-employment and periodic examinations.

Two things should be accomplished as a result of the pre-employment examination; first, an appraisal of the physical condition of the prospective worker and of his ability to assume the work to which he is to be assigned; second, an effort on the part of the examining physician to prevent a man with contagious disease from working in contact with others or doing work which, because

of his physical condition, would be dangerous to the man himself or to others. The object of the examination is not to reject an applicant, rather it is an effort so to place a worker that he will be protected from contagion or from injury caused by his own or another's physical defects.

The periodic examination is made in order to check at regular intervals the condition of the worker, to discuss with him any defects or abnormalities discovered and to advise him as to their care. It may be an annual or a biennial event depending on the general condition of the individual and the health hazards to which he may be exposed at his work. In cases where the worker is exposed to any industrial hazard of a serious nature, the examination is made more frequently, with special emphasis on the signs and symptoms of early injury to health.

The method of conducting a physical examination in industry is becoming more or less standardized. It must be remembered, however, that the objects sought are not those of the life-insurance examination. The life-insurance examiner is particularly interested in the applicant's basic condition. His problem is to estimate the probable longevity of his patient. The industrial physician, on the other hand, is primarily interested in the probable working capacity of the individual, and he therefore appraises with great care certain abilities and functions which are comparatively unimportant to the life-insurance examiner. It is particularly important that the general practitioner who is called in by a neighboring factory to make examination of its workers should bear this distinction in mind.

The industrial physical examination is made in privacy in a suitably equipped room. The worker, if young, is examined completely stripped. Older workers are examined stripped to the waist at the start, later the trousers and underclothes are removed. The following routine of examination is suggested as a basis to which additions may be made if necessary:

Height.
Weight.
General appearance.
Skin.
Eyes (condition, reflexes, abnormalities), including vision in twenties and Snellen charts (each eye separately).
Ears (discharge), including hearing test with watch (Standard Yankee) at varying distances (each ear separately).
Nose (obstructions, deviation of septum and so forth).
Throat (condition of tonsils, pharynx and so forth).
Teeth (condition of gums, teeth needing extraction and so forth).
Neck (enlarged glands and so forth).
Chest contour (flat, emphysematous and so forth).
Chest expansion (inspiration and expiration measurement at nipple line), ability to hold breath 30 seconds.
Heart.
Lungs.
Pulse.
Blood pressure.
Arteriosclerosis (present or absent).
Abdomen.
Inguinal region (if hernia found, the type and degree).
Upper extremities (loss of fingers and so forth).
Lower extremities (varicose veins, ulcers, condition of feet and so forth).
Joints (restriction of motion, abnormalities of any kind).
Rectum (digital examination).
Genitourinary system, including prostate.
Spine, including all motions.
Reflexes (knee jerks especially).
Urinalysis (if albumin present, microscopic examination).
Blood (if indicated).
X-ray of chest (when indicated and in cases which will be exposed to a dust hazard).

The following defects have been found to be of particular importance:

Markedly defective vision uncompensated by glasses; blindness of one eye.
Marked deafness of both ears.
Hyperthyroidism.
Myocarditis.
Pulmonary tuberculosis; pleurisy with effusion.
Emphysema and chronic bronchitis; asthma; fibrosis of lung.
Glycosuria.
Chronic appendicitis.
Hypertension.
Chronic nephritis, with acute exacerbation.
Gonorrhea or syphilis, especially in active stage.
Chronic arthritis, especially of the spine.
Ankylosis of important joints.
Severe varicose veins, especially with edema of leg.
Chronic foot strain; deformities of foot or toes.
Hernias of all types.
Hypertrophy or infection of prostate.
Diseases of nervous system.
Dental conditions suggesting foci of infection.

The following parts of the worker's body should be given special attention: the eyes, the joints, the nervous system, the inguinal region, the condition of the extremities, the feet and the lungs.

The examining physician must not reject an applicant unless there is a very good reason. Where there is question, the worker should be passed but called back after a reasonable period and reexamined. It is good practice in these questionable cases for the doctor to visit the employee at his work in order to see just what he is doing and whether he appears able to do it without harm.

There are frequent cases where the applicant can work with greater safety and efficiency elsewhere than at the job for which he has been hired.

The doctor in these cases should discuss the matter with the employment manager or foreman and see if the worker cannot be employed at the more suitable type of work. A man is hired because he appears to the employment officer to have good qualifications for service in the company. The doctor must always remember this and see that in questionable cases every effort is made to render this service harmless to the man and of value to the company.

The pre-employment examination offers a splendid opportunity for the doctor to discuss with the applicant any abnormalities found during the examination and to tell him how such conditions may be rectified.

Those employees who have defects of a serious nature, those over sixty years of age and those who are exposed to an industrial hazard should receive a periodic examination at least annually. Careful notes are made at these examinations and further investigations should be made if indicated.

The original examination and all subsequent examinations are recorded on a special form or on the face of a folder which contains the other medical records of the employee.

In large factories the examining physician frequently classifies applicants or workers as A, B, C and D or 1, 2, 3 and 4. A Class A worker may work anywhere, as may one in Class B. Class B indicates a number of minor physical defects which should be corrected. Class C indicates that the man should work only in certain departments and at special types of work. He should not be transferred to other work or to another department without the consent of the medical department. Class D means that the man is unfit for work and should not be employed. Such a classification is of special value in large factories where the letter or number tells the employment department the result of the physical examination from an employment standpoint.

From the above it is obvious that the physician examining industrial workers must be familiar with the different kinds of work required in the factory and the physical type of worker best fitted for each department and must have a knowledge of those departments in which there is an industrial health hazard.

It will be seen from this résumé that the physical examination is the first step in medical supervision of the group of workers whose health is the responsibility of the industrial medical department.

W. Irving Clark, M.D., *Chairman,*
Louis R. Daniels, M.D.,
Noel G. Monroe, M.D.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions of the Medical Postgraduate Extension Courses have been arranged for the week beginning December 4:

BARNSTABLE

Sunday, December 10, at 4:00 p.m., at the Cape Cod Hospital, Hyannis. Head and Spine Injuries. Instructor: Donald Munro. Donald E. Higgins, *Chairman.*

BRISTOL NORTH

Thursday, December 7, at 4:00 p.m., at the Morton Hospital, Taunton. Common Problems of Neurology: Indications for lumbar puncture. Instructor: H. Houston Merritt. Lester E. Butler, *Chairman.*

BRISTOL SOUTH (New Bedford Section)

Friday, December 8, at 4:00 p.m., at St. Luke's Hospital, New Bedford. Gonorrhea in the Female. Instructor: Sylvester B. Kelley. Robert H. Goodwin, *Chairman.*

ESSEX NORTH

Friday, December 8, at 4:30 p.m., at the Lawrence General Hospital, Lawrence. Convulsions in Infants and Children: Etiology and treatment. Instructor: R. Cannon Eley. John Parr, *Chairman.*

ESSEX SOUTH

Tuesday, December 5, at 4:00 p.m., in the Conference Room of the Salem Hospital, Salem. Cardiovascular Disease: Eleven important questions about heart disease and their answers. Instructor: Howard B. Sprague. J. Robert Shaughnessy, *Chairman.*

MIDDLESEX EAST

Tuesday, December 5, at 4:00 p.m., at the Melrose Hospital, Melrose. Pneumonia. Instructor: Chester S. Keefer. Walter H. Flanders, *Chairman.*

MIDDLESEX NORTH

Friday, December 8, at 4:45 p.m., at St. John's Hospital, Lowell. Cardiovascular Disease: Eleven important questions about heart disease and their answers. Instructor: C. Edward Leach. William S. Lawler, *Chairman.*

WORCESTER (Milford Section)

Tuesday, December 5, at 8:30 p.m., in the Nurses' Home of the Milford Hospital, Milford. Cardiovascular Disease: Eleven important questions about heart disease and their answers. Instructor: Samuel A. Levine. Joseph Ashkins, *Chairman.*

WORCESTER (Worcester Section)

Friday, December 8, at 8:00 p.m., in the Staff Room of the Worcester City Hospital, Worcester. Syphilis in Pregnancy and the Offspring. Instructor: C. Guy Lane. George C. Tully, *Chairman.*

WORCESTER NORTH

Friday, December 8, at 4:30 p.m., in the Nurses'

Home of the Burbank Hospital, Fitchburg. Tuberculosis in Infancy and Childhood. Instructor: Clement A. Smith. George P. Keaveny, *Chairman.*

RESOLUTION

RESOLUTION RELATIVE TO THE DEATH OF HARVEY CUSHING

The following resolution was passed by the Board of Trustees of the Boston Medical Library at a meeting held on November 20:

By the death of Harvey Cushing on October 7, 1939, the Boston Medical Library lost one of its most devoted members. He became a member of the library in 1912, soon after his arrival in Boston to occupy the Moseley professorship of surgery at Harvard and to become the surgeon-in-chief at the Peter Bent Brigham Hospital. Many years before this, however, Cushing had an intimate acquaintance with the library. There is no doubt that he "looked in" as a house pupil at the Massachusetts General Hospital in 1895 and 1896, for 19 Boylston Place was the kind of refuge that Cushing would have found and Brigham and Chadwick the sort of men he was anxious to know. In the new building, moreover, on January 19, 1903, he read one of his early, important papers — a contribution which marked the beginning of blood-pressure determinations in this country.

From 1912 to 1932, Cushing was an almost constant user of this library. Although he rarely came to the library himself, except to attend a meeting or chat for a moment with Mr. Ballard, books and journals flowed freely and, at times, almost weekly from Miss McCrea's desk to the hospital and back. Many a carefully prepared list was brought down by the faithful Gus, his chauffeur, only to be filled and carried back in armfuls. How the doctor found time to read so many books was beyond Gus, but back and forth they went, only checked when Cushing took overseas duty from 1917 to 1919. Miss McCrea was an old friend, not forgotten after a period of particularly hard work. In the twenty years he was in Boston, Cushing wrote nine or ten important monographs, and papers too numerous to mention. Did anyone ever use the library more, or to better advantage? He acknowledged his "deep obligation" to the library in a graceful tribute published in 1926.

This is not the place to evaluate his position in American medicine. He was "the most distinguished of all surgeons in operative procedures on the brain," a scholar, a biographer, a bibliophile and an outstanding leader of the medical profession. He loved books, encouraged librarians and added to an American collection a notable library of his own. His influence was widely felt and many libraries owe him a profound debt of gratitude for his exemplification of all that books stand for. In the passing of the only honorary fellow of the Boston Medical Library we are keenly conscious that he is no longer in our midst.

MISCELLANY

NOTES

The following appointments to the teaching and research staff of the Harvard Medical School, effective as of September 1, 1939, were recently announced:

Walter J. E. Carroll, M.D. Jefferson Medical College '28, of Arlington, as assistant in laryngology; Joseph Lentine, M.D. Tufts College Medical School '32, of Milton, as assistant in laryngology; Burton E. Lovesey, M.D. Medico-Chirurgical College of Philadelphia '16, of Boston, as assistant in laryngology; Joseph T. Walker, Ph.D. Harvard '33, of Cambridge, as assistant in legal medicine; Birgit Vennesland, Ph.D. University of Chicago '38, of Chicago, as research fellow in biological chemistry; Robert H. Williams, M.D. Johns Hopkins '34, of Corinth, Mississippi, as research fellow in medicine; Arthur M. Doyle, M.D. University of Toronto '31, of Kingston, Ontario, Canada, as research fellow in neurology; Morley G. Whillans, M.D. University of Toronto, '35, of Toronto, Ontario, Canada, as research fellow in neurology; Jurgen Ruesch, M.D. University of Zurich '35, of Brighton, as research fellow in neuropathology; Juan P. Picena, M.D. University of Rosario, Argentina, '32, of Rosario, Argentina, as research fellow in pathology; Joshua C. Drooker, M.D. Tufts College Medical School '33, of Boston, as assistant in laryngology; Walter L. McClintock, M.D. Jefferson Medical School '32, of Quincy, as assistant in laryngology; Frank M. Wattles, M.D. Emory University '33, of Belmont, as assistant in laryngology. In addition, Morris B. Flanagan, M.D. Tufts College Medical School '34, of Dorchester, was appointed assistant in psychiatry, effective January 1, 1940.

Dr. George R. Minot, professor of medicine, Harvard Medical School, has been awarded the Gordon Wilson Medal of the American Clinical and Climatological Association. The presentation took place at a recent meeting of the association at Saranac Lake, New York, at which time Dr. Minot delivered the Gordon Wilson Lecture.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR OCTOBER, 1939

DISEASES	OCTOBER 1939	OCTOBER 1938	FIVE-YEAR AVERAGE*
Anterior poliomyelitis	21	5	56
Chickenpox	333	390	347
Diphtheria	24	18	28
Dog bite	827	775	745
Dysentery, bacillary	164	19	8
German measles	40	11	31
Gonorrhea	474	416	529
Lobar pneumonia	157	233	241
Measles	291	236	169
Meningococcus meningitis	5	5	7
Mumps	91	204	207
Paratyphoid B fever	3	4	1
Scarlet fever	180	275	407
Syphilis	464	400	441
Tuberculosis, pulmonary	239	232	275
Tuberculosis, other forms	24	35	34
Typhoid fever	4	2	10
Undulant fever	4	1	5
Whooping cough	347	375	431

*Based on figures for preceding five years.

RARE DISEASES

Anterior poliomyelitis was reported from: Boston, 4; Braintree, 1; Clinton, 1; Dudley, 1; Fall River, 2; Foxboro, 1; Haverhill, 1; Holbrook, 1; Lynn, 1; Somerville, 1; Wareham, 1; Watertown, 1; Winchester, 1; Worcester, 4; total, 21.

Diphtheria was reported from: Boston, 5; Cambridge, 3; Fall River, 4; Foxboro, 2; Lawrence, 3; Malden, 1; Methuen, 1; Somerville, 1; Wakefield, 2; Worcester, 1; Wrentham, 1; total, 24.

Dysentery, bacillary, was reported from: Boston, 9; Cambridge, 11; Danvers, 3; Dedham, 1; Fall River, 3; Framingham, 1; Lowell, 5; Medfield, 24; Medford, 1; Northampton, 1; Northboro, 1; Palmer, 1; Waltham, 9; Watertown, 5; Worcester, 2; Wrentham, 87; total, 164.

Infectious encephalitis was reported from: Holden, 1; total, 1.

Meningococcus meningitis was reported from: Berlin, 1; Fall River, 1; Fitchburg, 1; Plymouth, 1; Wellesley, 1; total, 5.

Paratyphoid B fever was reported from: Cambridge, 1; Everett, 1; Lynn, 1; total, 3.

Pellagra was reported from: Boston, 1; total, 1.

Pfeiffer bacillus meningitis was reported from: Arlington, 1; total, 1.

Septic sore throat was reported from: Arlington, 1; Boston, 4; Brockton, 1; Cambridge, 2; Greenfield, 1; Milford, 1; total, 10.

Tetanus was reported from: Billerica, 1; Westfield, 1; total, 2.

Trachoma was reported from: Boston, 2; total, 2.

Trichinosis was reported from: Fall River, 2; total, 2.

Typhoid fever was reported from: Belmont, 1; Boston, 2; Duxbury, 1; total, 4.

Undulant fever was reported from: Great Barrington, 1; Hopedale, 1; Montague, 1; North Reading, 1; total, 4.

Bacillary dysentery continues to be reported to an unusually high level.

For the fourth consecutive month, the reported incidence of lobar pneumonia reached its lowest level for the past five years.

The reported incidences of anterior poliomyelitis and meningococcus meningitis were within normal limits.

Mumps and scarlet fever continued to be reported at very low levels.

The reported incidences of diphtheria, typhoid fever, and paratyphoid B fever were encouragingly low.

Pulmonary tuberculosis, tuberculosis (other forms) and undulant fever were reported within the five-year average.

The reported incidences of chickenpox, measles, German measles, and whooping cough were not remarkable.

For the third consecutive mont. the reported incidence of dog bite reached a new high for the month.

CORRESPONDENCE

APPROVING AUTHORITY

To the Editor: In accordance with the vote of the Approving Authority on September 28, 1939, I enclose for your information a copy of the circular letter, with circular information and the law creating the Approving Authority in Massachusetts, to be sent to every medical school in the United States and Canada, to all state boards of registration, to certain medical journals and to the press.

STEPHEN RUSHMORE, M.D., *Chairman,*
Approving Authority.

State House, Boston.

* * *

COPY OF CIRCULAR LETTER FROM THE APPROVING AUTHORITY

Your attention is called to the enclosed copy of the Massachusetts statute creating an approving authority for colleges, universities and medical schools, which will become effective on January 1, 1941, for the rejection of candidates for examination for registration as qualified physicians on the ground of graduation from a non-approved school. There is enclosed also a circular of information concerning general requirements for approval of colleges, universities and medical schools.

In the evaluation of medical schools outside of Massachusetts, the Approving Authority will in general give due weight to the evaluation of such schools by the board of registration in medicine, or equivalent body, of the state in which the school is situated.

Nothing, however, in this letter or in the accompanying circular of information is to be interpreted as waiving the right of the Approving Authority to include in the basis for its decision concerning a college, university or medical school, evidence disclosed by its own investigations.

MIDDLESEX UNIVERSITY SCHOOL OF MEDICINE

To the Editor: I have been approached by the Graduate Association of the Middlesex University School of Medicine to state the terms under which I would serve as a trustee of their school. My statement was as follows:

My sole object in bringing up the subject of the Middlesex University School of Medicine for discussion is to improve in the immediate future the qualifications of its graduates who are to practice in Massachusetts.

If the medical school will meet the following requirements and the Governor of the Commonwealth and the Council of the Massachusetts Medical Society will agree each to appoint one seventh of the trustees, then I would accept membership on its Board of Trustees.

The requirements are:

1. *New Fund of $100,000.* The alumni of the school must show their confidence in it by securing funds for its immediate needs before either they or the school can expect anyone else to take an active interest. Therefore, the first condition is that $100,000 be pledged, and of this, $30,000 in cash deposited in a bank before February 1, 1940; $30,000 pledged to be deposited in cash by July 20, 1940; $40,000 pledged to be deposited in cash by January 20, 1941. The money should be obtained with the understanding that it is to be expended wholly in addition to present current expenditures and with the general approval of the Graduate Association of the Middlesex University School of Medicine and as follows:

   (*a*) $15,000 spent on instruction, including library and equipment, for the benefit of the first-two-year classes before July 1, 1940.
   (*b*) $40,000 likewise expended during the school year 1940-1941 but to be distributed according to the needs of the entire four years.
   (*c*) $45,000 similarly to be expended during 1941-1942.

It is recognized that these expenditures do not meet what is necessary, but they should bring about a relatively marked improvement in the education of the students.

2. *Valuation of the Property.* The value of the school property should be determined. Whether the land and buildings are worth $300,000 or $1,000,000 I do not know, but the assessed value should be considered and what the actual value would be if the entire property were put up for sale. For example, the library may have books which originally cost $30,000 but today if put at auction might not bring $1000; consequently, the value of the library as everything else in the school should be estimated by its salable value. Such total valuation within the limits of $100,000 should be easily made by an expert from the First National Bank, the Boston Safe Deposit and

Trust Company, the State Street Trust Company or any large banking institution in good standing.

3. *The Debt Funded and Held by Responsible Organizations.* That the debt of the school shall be funded and the loan held by one, two or three responsible organizations, just as at a certain Boston hospital all its debts are funded in one sum by an arrangement with a large life insurance company; and that the rate of interest shall not exceed 4 per cent.

4. *Yearly Publications of Finances.* In accordance with the custom of charitable institutions incorporated in the Commonwealth a complete financial statement shall be published annually.

5. *Limitation of Students.* Limitation of students, after this school year, 1939-1940, to an entering class of 75 with the understanding that no one of the remaining three classes shall exceed this number except in the next three years if this is necessary to accommodate those now enrolled in the first, second and third years.

6. *Anatomical and Clinical Facilities.* That anatomical facilities shall be assured and that a hospital or hospitals shall indicate that, when all the foregoing conditions are met, they will make 200 beds in their institution or institutions available for the clinical instruction of Middlesex medical students.

7. *Composition of Board of Trustees.* That one seventh of the Board of Trustees shall be chosen by graduates of the school licensed to practice in Massachusetts, one seventh by the Governor of Massachusetts, one seventh by a committee appointed by the Council of the Massachusetts Medical Society, each for five-year terms, and the remaining four sevenths by the present or then existing Board of Trustees of the Middlesex University School of Medicine and that either none or not more than one seventh of the trustees shall be members of the faculty, with the understanding that no faculty member shall have voting power.

Unhesitatingly I believe that, if the conditions above set forth are met, the education of the students of the school will be so advanced that it will deserve and receive further support in all ways.

I append the reply of the Graduate Association of the Middlesex University School of Medicine to my statement.

ELLIOTT P. JOSLIN.

81 Bay State Road,
Boston.

* * *

Dr. Elliott P. Joslin:

The Graduate Association of the Middlesex University School of Medicine accepts your requirements in so far as it is empowered to act. Upon the acceptance by the university of the parts of the contract pertaining to the medical school, the association will fulfill the new-fund contract as set aside in Part 1.

In behalf of the graduates of the Middlesex University School of Medicine we extend to you our thanks for your aid in our efforts toward obtaining approval of our school.

HAROLD L. MUSGRAVE, *President,*
M. L. KRAFT, *Secretary.*
Graduate Association, Middlesex University
School of Medicine.

REPORT OF MEETING

THE THIRD INTERNATIONAL NEUROLOGICAL CONGRESS

The Third International Neurological Congress was held at Copenhagen, Denmark, August 21 to 25, 1939, with an attendance of about 500 physicians from all parts of the world. In spite of the unrest in Europe at the time, there were representatives at the Congress from all countries. Most of the delegates remained until the last day; only the English delegation felt it incumbent upon themselves to leave the Congress before the sessions were over. The meetings were held at the University of Copenhagen and the Congress was opened by His Majesty the King of Denmark in an impressive ceremony on August 21. The scientific sessions began the same day and the topic "The Endocrine-Vegetative System with Special Reference to Neurology" was considered. On Tuesday, August 22, the topic was "The Heredofamilial Diseases, Especially from the Genetic Aspect." Both these topics were discussed by special reporters and, in addition, there were numerous papers by members of the Congress. On Thursday, August 24, the Congress was resumed, after a day given to entertainment. On that day the Congress was divided into various sections and a large number of papers were read on anatomy and pathology, clinical neurology, therapy, epilepsy and neurosurgery. On Friday, the last day, the topic "Neurological Aspects of the Avitaminoses with Special Reference to the Peripheral Nervous System" was considered by a group of special reporters and also in a series of papers by other members of the Congress. In general the papers were of high quality, particularly the reviews submitted by the special reporters on topics which had been chosen in advance.

Of the many papers, a few deserve special mention. Sir Henry H. Dale, of London, summarized his work in a paper entitled "Chemical Mediation in the Peripheral Nervous System and Its Relation to Endocrine Organs." He believes that acetylcholine serves as a transmitter of the excitatory process at the ganglionic synapses and at the motor nerve endings in voluntary muscles. At the preganglionic synapse, acetylcholine acts on the parasympathetic system, as well as the sympathetic system, as the chief transmitter. On the other hand, the postganglionic synapse is partly served by acetylcholine. Adrenaline, on the other hand, does not serve as a transmitter for voluntary impulses, but does almost exclusively serve at the preganglionic sympathetic synapse and rarely at the preganglionic parasympathetic synapse. It is also held at the endings of most of the postganglionic fibers of the sympathetic system. The method of disappearance of acetylcholine after its liberation, with such speed as to be completely within the refractory period of the ganglion cell or muscle fiber, is a point of uncertainty. In the case of voluntary muscles it can be shown that depression of the cholinesterase action by physostigmine or Prostigmin causes a single motor nerve to go into tetanus. It seems most probable that the function of the cholinesterase at the nerve ending is to prevent excess of acetylcholine liberated by an impulse from producing depression, rather than to secure its complete removal during the refractory period. Some other mechanism seems to be required for this. Another paper was on the anatomy of the cortical and bulbospinal sections of the autonomic nervous system by Dr. Laruelle, of Brussels. The author demonstrated by a series of excellent charts the details of this system, his researches having brought to light considerable new material based on a study of longitudinal sec-

tions of the nervous system rather than that of the usual cross sections. Dr. John F. Fulton, of New Haven, Connecticut, spoke on "Central Levels of Autonomic Function, with Particular Reference to the Cerebral Cortex and the Endocrine Organs," paying special attention to the hypothalamic level and that of the cerebral cortex. The autonomic function of the hypothalamic region is closely associated with the innervation of the pituitary gland and the control of the kidney through the posterior-lobe hormone, and the regulation of thyroid, adrenocortical and ovarian activities through the anterior-lobe hormone. The regulation of body temperature, moreover, is controlled from the hypothalamus. This level is under direct control of the cortex, and thus it seems reasonable to assume that the cerebral cortex plays an intimate part in regulating the activity of the endocrines, as does the hypothalamus itself. It has already been shown that the adrenal medulla can be made to secrete as the result of stimulation of the frontal lobes.

Sir Edward Mellanby, of London, summarized his views in regard to the neurological aspects of the avitaminoses. Nicotinic acid acts as the pellagra-preventing factor, but also has an effect on the central and peripheral nerve lesions of this disease. It appears to be particularly useful in the treatment of the psychotic states associated with pellagra. It is also probable that vitamin B_6 and vitamin A will both prove to be of value in treating neurologic conditions. In addition, there is the well-known effect of vitamin B_1, and lack of it probably prevents proper nerve function, largely because it interferes with carbohydrate oxidation, a type of metabolic process on which the nervous tissue is unusually dependent. Dr. Israel S. Wechsler, of New York, emphasized that many cases of polyneuritis probably represent true deficiency syndromes and belong to the class of avitaminoses. He even suggested that polyneuritis due to arsenic, diabetes or phosphorus might be on the same basis. Dr. Wechsler's point of view was borne out by Dr. Charles C. Ungley, of Newcastle, England. He stated that in the majority, if not all, of thirty-six cases of polyneuritis avitaminosis was probably responsible for the chief symptoms. It did not appear, however, to be an important factor in diabetic neuritis or neuritis due to gout, lead, diphtheria toxin or certain unexplained causes. Dr. H. P. Stubbe Teglbjaerg, of Denmark, gave an excellent summary of the treatment of various nervous disorders with vitamin B_1. He advocated its use in all cases of peripheral neuritis irrespective of etiology. The body probably requires 1 to 2 mg. per day by mouth of vitamin B_1, but during pregnancy, lactation, fever, hyperthyroidism and other pathologic conditions this amount should be increased five to ten times. The greatest effect is obtained when the vitamin is given intravenously. Overdosage does not appear to cause injury.

The Surgical Section of the Congress met on Thursday, August 24. In the absence of Mr. Geoffrey Jefferson, of Manchester, England, Dr. W. Jason Mixter, of Boston, presided. In general the character of the papers was excellent. Particular reference should be made to the paper by Dr. E. Busch, of Copenhagen, on traumatic epilepsy, that by Dr. Erik Lysholm, of Stockholm, on ventriculography, that by Dr. Arne Torkildsen, of Oslo, on occlusion of the Sylvian aqueduct and that by Professor H. Olivecrona, of Stockholm, on the acoustic neurinomas. It was unfortunate that a number of distinguished neurosurgeons on the program were prevented from being present by the tense international situation.

The members of the Congress were entertained in a generous manner by their colleagues in Scandinavia. There was an official reception on Sunday, August 20, a banquet in the Town Hall on Monday and excursions to the Castles of Kronborg and Frederiksborg on Wednesday, with the official banquet of the Congress on Thursday evening. In addition there were many informal dinners given by the Danish neurologists to the various delegates. The only honorary president of the Congress present was Dr. Gordon Holmes, of London. The president was Professor Viggo Christiansen, of Copenhagen, long a leader in neurology and practically the founder of neurology as a specialty in Copenhagen. He was ably assisted by his Scandinavian colleagues, Professor Antoni, of Sweden, Professor Fabritius, of Finland, and Professor Monrad-Krohn, of Norway, and by the secretary-general, Dr. K. H. Krabbe, of Copenhagen.

The Congress served to join together, through their common interests, many of the leading neurologists of the Continent and America. No one who attended this Congress, so skillfully arranged under the impending threat of a European war, could leave Copenhagen without a feeling of sincere sympathy for friends who were soon to be caught in a conflict not of their own choosing. It was indeed fortunate that the Congress could be held in Copenhagen and that its sessions were completed a week before war broke out.

It will be of particular interest to the readers of the *Journal* to know that the following twelve papers* were presented by members of the Congress from the New England states.

Dr. John F. Fulton (New Haven): Central Levels of Autonomic Function, with Particular Reference to the Cerebral Cortex and the Endocrine Organs.

Dr. Abraham Myerson (Boston): Human Autonomic Pharmacology.

Drs. Henry R. Viets and Robert S. Schwab (Boston): Myasthenia Gravis: A historical and clinical motion picture.

Drs. Robert S. Schwab and Henry R. Viets (Boston): Myasthenia Gravis: Clinical observation of fifty cases.

Drs. Madelaine R. Brown and John H. Talbott (Boston): The Role of Potassium Chloride in the Treatment of Ménière's Syndrome.

Drs. W. G. Lennox, E. L. Gibbs and F. A. Gibbs (Boston): The Inheritance of Epilepsy as Revealed by the Electroencephalograph.

Drs. H. Houston Merritt and Tracy J. Putnam (Boston): On Diphenyl Hydantoin and Other New Anticonvulsant Drugs.

Drs. William J. German and Max Taffel (New Haven): Surgical Production of Collateral Intracranial Circulation: An experimental study.

Drs. W. Jason Mixter and Joseph S. Barr (Boston): Rupture of the Lower Lumbar Intervertebral Disks.

Dr. Leo Alexander (Boston): Beri-Beri and Wernicke's Hemorrhagic Polioencephalitis: An experimental study.

Dr. Tracy J. Putnam (Boston): The Treatment of Athetosis by Section of Extrapyramidal Tracts. (Read by title.)

Dr. James L. Poppen (Boston): Sphenoid Ridge Meningioma *en plaque:* Surgical technic. (Read by title.)

*Full abstracts of all the papers given at the Congress have been published in booklet form under the title, *III Internationale Neurolog-Kongres.* Copenhagen: Einar Munksgaard, 1939.

NOTICES

ANNOUNCEMENT

HERMAN BEIGELMAN, M.D., announces the opening of an office at 36 Quincy Avenue, East Braintree.

REMOVAL

REGINALD D. MARGESON, M.D., announces the removal of his office to 1101 Beacon Street, Brookline.

BOSTON DOCTORS' SYMPHONY ORCHESTRA

The Boston Doctors' Symphony Orchestra will rehearse under Alexander Theide, former concertmaster with the Cleveland Symphony Orchestra and the Philadelphia Symphony Orchestra, every Thursday at 8:30 p.m., in Studio A, Station WMEX, 70 Brookline Avenue, Boston. Those interested in becoming members should communicate with Dr. Julius Loman, Pelham Hall Hotel, Brookline (BEA 2430).

JOSEPH H. PRATT DIAGNOSTIC HOSPITAL

Bennet Street, Boston
Auditorium, 9-10 a. m.

MEDICAL CONFERENCE PROGRAM

Friday, December 1 — A Psychology of the Hard of Hearing. Mr. C. G. Loring.
Saturday, December 2 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Tuesday, December 5 — Diagnosis and Treatment of Internal Derangements of Knee Joints. Dr. John D. Adams.
Wednesday, December 6 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, December 7 — Auricular Conduction in the Mammalian Heart. Dr. Emanuel Ginsburg.
Friday, December 8 — Recent Studies on Liver Disease. Dr. Franklin W. White.
Saturday, December 9 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Tuesday, December 12 — Some Ophthalmoscopic Signs in Constitutional Disease. Dr. Joseph J. Skirball.
Wednesday, December 13 — Hospital Case Presentation. Dr. S. J. Thannhauser.
Thursday, December 14 — Gastrointestinal Clinic: Presentation of cases. Dr. K. S. Andrews.
Friday, December 15 — Sir James Mackenzie: General practitioner. Dr. Joseph H. Pratt.
Saturday, December 16 — Hospital Case Presentation. Dr. S. J. Thannhauser.

Medical conferences will be resumed Tuesday morning, January 2, 1940.

PETER BENT BRIGHAM HOSPITAL

A joint medical and surgical clinic at the Peter Bent Brigham Hospital will be held on Wednesday, December 6, from 2 to 4 p.m. Drs. Stanley Emory and Robert Zollinger will speak on "Diarrhea and Constipation." A clinicopathological conference, conducted by Dr. Elliott C. Cutler, will take place from 4 to 5 p.m.

On Thursday, December 7, from 8:30 to 9:30 a.m. there will be at the Peter Bent Brigham Hospital, a combined clinic, conducted by Dr. Soma Weiss, of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital.

Physicians and students are cordially invited to attend.

ELLIOTT C. CUTLER, M.D., *Secretary.*

GREATER BOSTON MEDICAL SOCIETY

A meeting of the Greater Boston Medical Society will be held in the auditorium of the Beth Israel Hospital on Tuesday, December 5, at 8:15 p.m.

Dr. Emil Novak, associate professor of obstetrics, University of Maryland, will speak on "Gynecological Endocrinology and Organotherapy." Discussion by Drs. Joseph C. Aub, Max Davis and Samuel L. Gargill.

MAX RITVO, M.D., *President,*
D. B. STEARNS, M.D., *Secretary.*

FAULKNER HOSPITAL CLINICOPATHOLOGICAL CONFERENCE

The monthly clinicopathological conference of the Faulkner Hospital will be held on Thursday, December 7, at 5:00 p.m. Dr. Maxwell Finland will speak on "Chemotherapy and Serotherapy in Pneumonia."

Interested members of the medical profession are invited to attend.

WALTHAM MEDICAL MEETINGS

The following medical meetings will be held in Waltham during December:

WALTHAM HOSPITAL:

December 8. Staff Meeting — 8:30 p.m.
December 15. Clinicopathological Conference — 8:30 p.m.
December 22. Waltham Medical Club Meeting — 8:30 p.m.

MIDDLESEX SANATORIUM:

December 4. Clinicopathological Conference — 8:00 p.m.
Staff Conferences: every Wednesday at 9:00 a.m. and every Friday at 2:00 p.m.

METROPOLITAN STATE HOSPITAL:

Staff Meetings: every Monday, Tuesday, Wednesday and Thursday at 11:00 a.m.
X-Ray Conferences: every Wednesday at 2:00 p.m.
Neurological Conferences: every Wednesday at 3:00 p.m.
December 27. Clinicopathological Conference — 8:00 p.m.

WALTER E. FERNALD SCHOOL:

Outpatient Clinics: every Wednesday morning.
Staff Meetings: every Thursday morning.

All interested physicians are cordially invited to attend any of these meetings.

UNITED STATES MARINE HOSPITAL

The staff meeting of the United States Marine Hospital, Chelsea, Massachusetts, will be held at "The Hut," on Wednesday afternoon, December 6, at 4:00.

PROGRAM

The Clinical and Laboratory Aspects of Fungous Infections. John G. Downing, M.D.

JOHN W. TRASK, *Medical Director in Charge.*

INTERNATIONAL COLLEGE OF SURGEONS

The New England Section of the International College of Surgeons will hold a Postgraduate Study Guild at the

Westfield State Sanatorium, Cancer Section, on Wednesday, December 13.

PROGRAM

9 a.m. to 12 m.

Plastic Surgery Case. Dr. E. M. Daland.
One-Stage Abdominoperineal Operation for Carcinoma of Rectum. Dr. F. H. Baehr.
Subtotal Gastrectomy: Carcinoma of stomach. Dr. E. W. Beauchamp.
Genitourinary Case. Dr. A. J. Connelly.

2 p.m. to 4:30 p.m.

Five-Year End Results of Breast Cancer at Pondville Hospital. Dr. E. M. Daland.
Our Attitude toward Cancer of the Breast. Dr. E. W. Beauchamp.
Presentation of Three Cases of Malignant Melanoma. Dr. F. H. Baehr.
Metastatic Malignancies of the Lungs and Skeleton. Dr. J. W. Turner.
Urological Complications of Carcinoma of Cervix and Rectum. Dr. J. A. Seaman.
Our Experience with Diagnosis and Treatment of the Leukemias. Dr. J. E. Dwyer.
Endometrial Sarcoma. Dr. R. M. Fienberg.
The Antemortem Recognition of Fatal Pulmonary Embolism. Dr. A. S. Johnson.
The Choice of Operations for Rectal Malignancies. Dr. F. S. Hopkins.
The Treatment of Cancer of the Vulva. Dr. A. J. Douglas.

Dr. Paul J. Jakmauh, Massachusetts commissioner of public health, will give an address of welcome in opening the afternoon program. Dr. George S. Foster, of Manchester, New Hampshire, will preside. Luncheon will be served to guests. All physicians are cordially invited.

SOCIETY MEETINGS AND CONFERENCES

Calendar of Boston District for the Week Beginning Monday, December 4

Monday, December 4

*12:15 p.m.–1:15 p.m. Clinicopathological conference. Dr. S. Burt Wolbach. Peter Bent Brigham Hospital amphitheater.

*4 p.m. Physicians and medical students are cordially invited to attend a clinic presented by the medical, surgical and orthopedic services of the Infants' and Children's hospitals in the amphitheater of the Children's Hospital.

Tuesday, December 5

*9–10 a.m. Diagnosis and Treatment of Internal Derangements of Knee Joints. Dr. John D. Adams. Joseph H. Pratt Diagnostic Hospital.

*10 a.m.–12:30 p.m. Boston Dispensary tumor clinic.

*12:15 p.m.–1:15 p.m. X-ray conference. Dr. Merrill C. Sosman. Peter Bent Brigham Hospital amphitheater.

6:30 p.m. Massachusetts Hospital Association. Parker House, Boston.

8:15 p.m. Greater Boston Medical Society. Auditorium, Beth Israel Hospital.

Wednesday, December 6

New England Obstetrical and Gynecological Society.

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.

*12 m. Clinicopathological conference. Children's Hospital amphitheater.

*2 p.m.–4 p.m. Joint medical and surgical clinic. Peter Bent Brigham Hospital.

Thursday, December 7

*8:30 a.m.–9:30 a.m. Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital, at the Children's Hospital.

*9–10 a.m. Auricular Conduction in the Mammalian Heart. Dr. Emanuel Ginsburg. Joseph H. Pratt Diagnostic Hospital.

*5 p.m. Faulkner Hospital clinicopathological conference.

7 p.m. New England Hospital for Women and Children. Clinical conference and meeting of staff.

Friday, December 8

*9–10 a.m. Recent Studies on Liver Disease. Dr. Franklin W. White. Joseph H. Pratt Diagnostic Hospital.

*10 a.m.–12:30 p.m. Boston Dispensary tumor clinic.

*8 p.m. William Harvey Society. Auditorium, Beth Israel Hospital.

Saturday, December 9

*9–10 a.m. Hospital case presentation. Dr. S. J. Thannhauser. Joseph H. Pratt Diagnostic Hospital.

*10 a.m.–12 m. Medical staff rounds of the Peter Bent Brigham Hospital. Conducted by Dr. Soma Weiss.

*Open to the medical profession.

December 1 — Boston Dispensary. "The Psychology of the Hard of Hearing." Mr. John C. G. Loring. Page 840, issue of November 23.

December 1–16 — Joseph H. Pratt Diagnostic Hospital. Medical Conference Program. Page 880.

December 2 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

December 4 — Middlesex Sanatorium. Clinicopathological conference. Page 880.

December 5 — Massachusetts Hospital Association. Page 798, issue of November 16.

December 5 — Greater Boston Medical Society. Page 880.

December 6 — Peter Bent Brigham Hospital. Joint medical and surgical clinic. Page 880.

December 6 — United States Marine Hospital. Staff meeting. Page 880.

December 6 — Wachusett Medical Improvement Society. Page 798, issue of November 16.

December 6 — New England Obstetrical and Gynecological Society. Page 759, issue of November 9.

December 7 — Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital. Page 880.

December 7 — Faulkner Hospital clinicopathological conference. Page 880.

December 7 — New England Hospital for Women and Children. Page 841, issue of November 23.

December 8 — William Harvey Society. Page 676, issue of October 26.

December 8 — Waltham Hospital. Staff meeting. Page 880.

December 13 — International College of Surgeons. Page 880.

December 14 — Pentucket Association of Physicians. 8:30 p.m., Hotel Bartlett, Haverhill.

December 15 — Waltham Hospital. Clinicopathological conference. Page 880.

December 22 — Waltham Medical Club. Page 880.

December 27 — Metropolitan State Hospital. Clinicopathological conference. Page 880.

January 6, June 8–11, 1940 — American Board of Obstetrics and Gynecology. Page 160, issue of July 27, and page 798, issue of November 16.

January 22–25, 1940 — American Academy of Orthopaedic Surgeons. Hotel Statler, Boston.

February 11–14 — International College of Surgeons. Page 759, issue of November 9.

March 2, June 8 and 10 — American Board of Ophthalmology. Page 719, issue of November 2.

March 7–9, 1940 — The New England Hospital Association. Hotel Statler, Boston.

May 14, 1940 — Pharmacopoeial Convention. Page 894, issue of May 25.

June 7–9, 1940 — American Board of Obstetrics and Gynecology. Page 1019, issue of June 15.

District Medical Societies

ESSEX NORTH

January 3, 1940 — Semi-annual meeting. Combined meeting with Essex South. Danvers State Hospital, Hathorne. 7 p.m.

ESSEX SOUTH

December 6 — "Pyelonephritis and Its Relation to Other Inflammatory Diseases of the Kidney." Dr. Soma Weiss. Salem Hospital, Salem.

January 3, 1940 — "Head Injuries." Dr. John S. Hodgson. Danvers State Hospital, Hathorne.

February 14 — "Cough, Sputum, Hemoptysis — How shall they be investigated?" Dr. Reeve H. Betts. Essex Sanatorium, Middleton.

March 6 — "Experimental and Clinical Considerations of Sulfanilamide Treatment of Hemolytic Streptococcal Infections." Dr. Champ Lyons. Lynn Hospital, Lynn.

April 3 — Addison Gilbert Hospital, Gloucester.

May 8 — Annual meeting. Salem Country Club, Peabody.

HAMPSHIRE

January 10, 1940.

March 13.

May 8.

All meetings are held at 11:30 a.m. at the Cooley Dickinson Hospital, Northampton.

MIDDLESEX EAST
January 10, 1940.
March 20.
May 15.
Meetings are held at 12:15 p.m. at the Unicorn Country Club, Stoneham.

MIDDLESEX NORTH
January 31, 1940.
April 24.
July 31.
October 30.

NORFOLK SOUTH
December 7.
January 4, 1940.
February 1.
March 7.
April 4.
May 2.
All meetings, with the exception of one which is usually held at the Quincy City Hospital, are held at the Norfolk County Hospital in South Braintree, at 12 o'clock noon.

PLYMOUTH
January 18, 1940 — Brockton Hospital, Brockton.
March 21 — Goddard Hospital, Brockton.
April 18 — State Farm.
May 16 — Lakeville Sanatorium, Lakeville.

SUFFOLK
January 31, 1940 — Scientific meeting. Subject to be announced later.
March 27 — Scientific meeting. Symposium on Ulcerative Colitis and Diarrheas. Under the direction of Dr. Chester M. Jones.
April 24 — Annual meeting in conjunction with the Boston Medical Library. Election of officers. Program and speakers to be announced later.

WORCESTER
December 13 — St. Vincent Hospital.
January 10, 1940 — Worcester City Hospital.
February 14 — Worcester State Hospital.
March 13 — Worcester Memorial Hospital.
April 10 — Worcester Hahnemann Hospital.
May 8 — Worcester Country Club.
Each meeting begins with a dinner at 6:30 p.m. and is followed by a business and scientific meeting.

BOOKS RECEIVED FOR REVIEW

Bacteriology. Clio Medica 22. William W. Ford. 207 pp. New York and London: Paul B. Hoeber, Inc., 1939. $2.50.

Facts and Theories of Psychoanalysis. Ives Hendrick. Second edition. 369 pp. New York: Alfred A. Knopf, 1939. $3.00.

Benzene (Benzol) Poisoning: Five papers. Reprinted from *The Journal of Industrial Hygiene and Toxicology,* Vol. 21, No. 8, 1939. 114 pp. Boston: Journal of Industrial Hygiene and Toxicology, 1939. $1.00.

Cancer of the Larynx. Chevalier Jackson and Chevalier L. Jackson. 309 pp. Philadelphia and London: W. B. Saunders Co., 1939. $8.00.

Supervision in Public Health Nursing. Violet H. Hodgson. 376 pp. New York: The Commonwealth Fund, 1939. $2.50.

In Memoria del Prof. Fabio Rivalta. Società Medico-Chirurgica di Romagna. 398 pp. Faenza, Italy: Fratelli Lega, 1939.

Studies from the Rockefeller Institute for Medical Research. Vol. 113. 604 pp. New York: The Rockefeller Institute for Medical Research, 1939. $2.00.

Health in Handcuffs. John A. Kingsbury. 210 pp. New York: Modern Age Books, Inc., 1939. 75c.

A Manual for Diabetic Patients. W. D. Sansum, Alfred E. Koehler and Ruth Bowden. 227 pp. New York: The Macmillan Co., 1939. $3.25.

Epidemiology in Country Practice. William N. Pickles. 110 pp. Baltimore: Williams & Wilkins Co., 1939. $2.50.

An Introduction to Dermatology. Norman Walker and G. H. Percival. Tenth edition. 391 pp. Baltimore: Williams & Wilkins Co., 1939. $7.00.

Twilight of Man. Earnest A. Hooton. 308 pp. New York: G. P. Putnam's Sons, 1939. $3.00.

The Physiological Basis of Medical Practice: A University of Toronto text in applied physiology. Charles H. Best and Norman B. Taylor. Second edition. 1872 pp. Baltimore: Williams and Wilkins Co., 1939. $10.00.

Tumors of the Hands and Feet. Edited by George T. Pack. 138 pp. St. Louis: C. V. Mosby Co., 1939. $3.00.

BOOK REVIEWS

Relation of Trauma to New Growths: Medico-legal aspects. R. J. Behan. 425 pp. Baltimore: Williams & Wilkins Co., 1939. $5.00.

This volume would probably not have been written but for the questions as to the etiology of neoplasms that are all too frequently raised in the courts in connection with the various workmen's compensation laws. As the author points out in his preface, the average physician is only rarely called to testify in such a case and heretofore it has only been with considerable difficulty that he has been able to secure reliable data on the problem. This book should therefore fill a distinct need. All types of neoplasm and the relation of their life history to trauma are reviewed in the thirty chapters. The author has had the assistance of several lawyers in the compilation of the book, and it should be as useful to the legal profession as to physicians. There is an excellent bibliography at the end of each chapter.

While this book will hardly be useful in the everyday practice of medicine, it will undoubtedly prove to be invaluable to many physicians who are called to testify on the relation of injury to the etiology or life history of a new growth.

Brucellosis in Man and Animals. I. Forest Huddleson. 339 pp. New York: The Commonwealth Fund, 1939. $3.50.

This monograph on brucellosis is an expanded and up-to-date edition of the volume entitled *Brucella Infections in Animals and Man* (1934). The former volume dealt only with bacteriological aspects of the subject. The new monograph presents the important aspects of diagnosis and treatment with considerable thoroughness. The book should prove of inestimable value to practicing physicians and veterinarians, as well as to laboratory workers concerned with Brucella.

Roentgen Technique. Clyde McNeill. 315 pp. Springfield, Illinois, and Baltimore: Charles C Thomas, 1939. $5.00.

In the reviewer's opinion this is the most concise and at the same time the most complete manual of roentgen technic published to date.

The book is replete with photographs, line drawings, charts and tables for handy reference. The more recent technical procedures of pelvimetry, encephalography, kymography and tomography are described. Authors are credited and references given to the original articles for detailed study.

Not only the roentgen technician but also the roentgenologist will find this book indispensable.